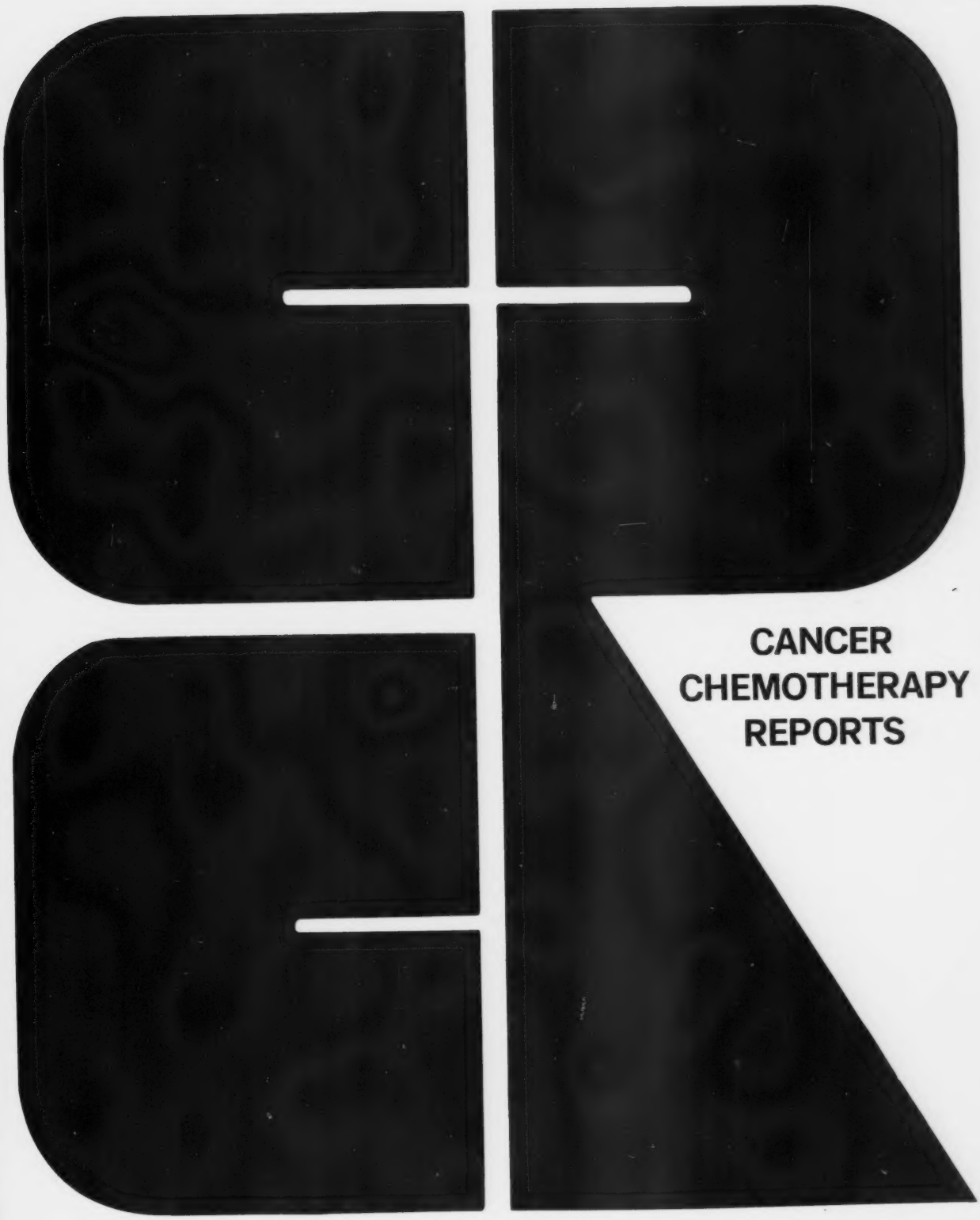

CANCER CHEMOTHERAPY REPORTS

Part 2

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Cancer Chemotherapy Reports

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Screening Study on Taiwan Plants for Antitumor Activities[1,2]

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S. J. Wang,[3] J. L. Hartwell,[4] and B. J. Abbott[4]

SUMMARY

Extracts of 500 species of plants indigenous to Taiwan and its nearby islets were tested in Drug Research and Development transplantable rodent tumors (the L1210 lymphoid leukemia, the P388 lymphocytic leukemia, and the Walker 256 carcinosarcoma) and in the human nasopharynx KB carcinoma by cell culture technique. Data are reported only on materials which have not demonstrated sufficient activity in these systems to warrant additional investigation.

[Cancer Chemother Rep Part 2, vol 4(3):1–96, 1974]

The present investigation was aimed at testing the antitumor effects of the plants indigenous to Taiwan and its nearby islets on different Drug Research and Development (DR&D), Division of Cancer Treatment, National Cancer Institute experimental tumor systems. Special interest has been centered on those plants described in Pen-Tzao-Kang-Mu, the Chinese Materia Medica (1), as possessing such possible properties. This paper represents the first part of the series on 500 species of plants that failed to demonstrate sufficient activity in the tumor systems used in this study to warrant additional investigation. The results are presented in a unified line summary for each extract. All extracts were first tested at a dose of 400 mg/kg; where toxicity was encountered the dose was reduced and the maximum tolerated dose[5] is reported.

All the plant extracts were tested against two or three of the following transplanted rodent tumors: L1210 lymphoid leukemia and P388 lymphocytic leukemia in mice, and Walker 256 carcinosarcoma (intramuscular) in albino rats. Extracts were also tested against human nasopharynx epidermoid carcinoma by cell culture technique.

MATERIALS AND METHODS

Collection of Plants

The plants were collected from Taiwan and its nearby islets, ranging from 30–40 meters under sea water to 3000 meters above sea level. The samples were identified and a voucher specimen for each plant was prepared and deposited in herbaria for future reference.[6] During the course of the continuing study, lists

[1] Received Mar 23, 1973; accepted July 12, 1973.

[2] The investigation at the National Defense Medical Center, Taipei, Taiwan, was supported in part by the China Medical Board, Inc., New York, NY (grant CMB–64–101), Dr. Sun Yat-Sen Science and Technology Research Foundation, and the International Economic Cooperation and Development and the National Science council of the Chinese Government.

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[4] Drug Research and Development (formerly Cancer Chemotherapy National Service Center), Division of Cancer Treatment, National Cancer Institute, Bethesda, Md.

[5] The maximum tolerated dose for a single experiment is defined as the highest dose which produces two or fewer deaths among six animals or three or fewer deaths among ten animals.

[6] We thank M. T. Kao, National Taiwan University, W. S. Kan, Chinese Medical College, and F. C. Ho, Hungchun Botanical Garden, Taiwan Forestry Research Institute, for their help in the collection and identification of the specimens used in this investigation.

of plants collected were prepared and checked with the files of DR&D before extraction in order to avoid duplication with those of known activity and those already under testing by other laboratories. As a result, a total of 1171 species of local plants went through such procedure; only 15% (or 177 species) were found to have been studied to a certain extent.

Extraction of Plants

For most juicy plants or plant parts the water content was first determined on an aliquot part, and the extraction was effected on fresh material by a Waring blendor with a sufficient quantity of ethanol to make a final menstruum containing 50% of the alcohol (v/v) in strength. The mixture was then filtered and concentrated in a flash evaporator under reduced pressure at a temperature not exceeding 50°C almost to dryness. The last quantity of water was then removed in a lyophilizer or vacuum desiccator. For fibrous materials, about 200 g of dry powder was macerated in a 750-cc percolator by using H_2O and/or EtOH, as specified in each line summary, for 24 hours. The percolation was done at a moderate rate for 2 days or until the extraction was complete (usually 2000 cc of percolate). The extract was then concentrated in a flash evaporator (under reduced pressure almost to dryness at a temperature not exceeding 50° C) and was lyophilized or desiccated.

In Vivo Procedures

All the test data reported were obtained through laboratories under contract with the DR&D. Test procedures are described in a set of protocols (2) followed by all contractors. The identification codes of the screening laboratories are given in the Explanation of Abbreviations and Codes Used in Table 2.

Tumors and Animals

The plant extracts were tested in two or three transplanted rodent tumors: Walker 256 carcinosarcoma, L1210 lymphoid leukemia, and P388 lymphocytic leukemia. DBA/2 mice were used for propagation and BDF_1 mice were used for test in L1210 and P388 leukemias. Suitable non-inbred albino rats were used for propagation as well as for testing with Walker 256 carcinosarcoma. In order to minimize genetic drifts, the old tumors were replaced at specific intervals by new lines of standard and reliable tumors from the sources approved by DR&D.

Screening Procedure

For alcoholic extracts, the sample was dissolved in a small amount of 95% ethanol. The alcohol solution was dispersed in a 0.5% aqueous solution of methyl cellulose (MC) or carboxymethylcellulose (CMC). For the lyophilized aqueous extract the sample was dissolved in saline if possible or was suspended in MC or CMC solution.

Transplantation of tumors was carried out using aseptic procedures including the use of sterilized instruments and hooded areas. The sterility of each tumor was tested by inoculating in thioglycollate broth medium. The entire experiment was discarded if bacterial growth occurred within 48 hours of incubation.

The treatment procedure for each test is presented in each line of data summary (*see* Results). A two-stage sequential test procedure was used for all three in vivo systems.

For Walker 256 carcinosarcoma six animals were used for each test group and $6\sqrt{n}$ animals were used for the common control group tested simultaneously against "n" plant extracts (3). The tumor was transplanted by injection of 0.2 cc of 1–6 dilution of the tumor homogenate intramuscularly in the thigh of one hind leg of each albino rat. Following inoculation, the animals were weighed and randomized[†] into test groups of six or control groups of $6\sqrt{n}$. Treatment was started on Days 3–6 and the survivors were recorded daily thereafter. The animals were killed and weighed on Day 7. Both hind legs were removed at the hip joint and weighed separately.

The ratio of the mean tumor weight of the treated animals to that of the control animals ($T/C \times 100 = X\%$) and the difference in mean body weights (T–C) for all groups with $> 65\%$ survivors were determined.

For L1210 and P388 leukemias, the transplan-

[†] Various randomization procedures were used, but all were based on standard published tables of random numbers such as Kendall-Smith tables or the Rand Corporation "Million Random Digits."

tation was made by intraperitoneal inoculation on Day 1 of 0.1 cc diluted ascitic fluid containing 10^5 and 10^6 cancer cells respectively. The animals were randomized on Day 1 into test groups of six or control groups of $6\sqrt{n}$ which were tested simultaneously against "n" plant extracts. The treatment was started on Day 1 and the procedure for each test was reported with each line of summary data (*see* Results). All the survivors were killed on Day 30. The ratio of the mean survival time (in days) of the treated group to that of the control group in percent (T/C × 100 = X%) was calculated.

Deaths were recorded in all groups. In the L1210 and P388 leukemias, deaths before Day 6 were considered nonleukemic and formed the basis for toxicity evaluations. When a toxic result (> two deaths among six animals or three deaths among ten animals) was observed, the test was repeated at an appropriately lower dose until the maximum tolerated dose was reached. In addition, if the T/C value for the survival test was < 85%, the dose was considered too high and the test was repeated at a lower dose.

Quality Control

In addition to the sterility test and the frequent replacement of standard tumor lines, the quality of the tumor system was also controlled by the establishment of limits for death, "no takes," and mean tumor weight (in Walker 256 carcinosarcoma) or survival time (in L1210 and P388 leukemias) among control animals; deaths exceeding 10% among animals in the control group were considered excessive. Experiments in which the control animals fall outside of limits were evaluated and some or all tests were repeated as deemed necessary.

"Positive" control was conducted in order to detect the change in susceptibility of tumor lines to the drugs and technical errors which might occur. The drugs used for such control tests for different tumor systems are listed in table 1.

Cell Culture Procedure

Preparation of Materials

The plant extracts were not sterilized but were handled aseptically. They were dissolved in water or saline when possible. When the concentration failed to be obtained by using the previously mentioned solvents, solvent such as ethanol or dimethylformamide was used to effect the solution[8]; a sufficient amount of complete medium was then added to make up the volume convenient for dosing.

Cell Line

The monolayer culture of KB cells derived from a carcinoma of the nasopharynx (4) maintained on Eagle's basal medium plus 10% of suitable serum was used in this experiment. The cells were maintained in a state of rapid growth by frequent subculture generally for 3 or 4 days. The cultures were re-fed 24 hours before use in the test.

[8] If solvent other than saline or water was used, the final concentration of the solvent was less than the concentration known to affect the cell growth (7).

TABLE 1.—Positive controls for in vivo tumors

Tumor	Drug for positive control	Dose* (mg/kg/day)	Limit of positive control
L1210 leukemia	8-Azaguanine (NSC–749)	50	≥ 135%
P388 leukemia	Terephthalanilide, 2-chloro-4', 4''-di-2-imidazolin-2-yl- (NSC–60339)	16	≥ 135%
	Cyclophosphamide (NSC–26271)	22.5	≥ 135%
Walker 256 carcinosarcoma	Streptonigrin (NSC–45383)	0.2	Not established

*The dose of each positive control agent was selected in order to produce a substantial but not overwhelming response.

Test Procedures

The original procedure was similar to that described by Eagle and Foley (5). Cells were removed from the culture vial with trypsin or Versene, or by mechanical scraping. Dispersed cells were centrifuged and resuspended in complete medium or diluted without centrifugation to an inactive concentration of dispersing agent. About 50,000 cells in 1 ml of medium were implanted in a series of replicate 15-mm screw-cap culture tubes and incubated at 37° C for 24 hours. The medium of each tube was removed and fresh medium containing the drug was added and again incubated. The cultures were re-fed at 72 hours and the protein content was determined 1 or 2 days thereafter according to the method of Oyama and Eagle (6).

A simplified procedure was described by Smith et al (8). In this procedure, the suspension of cells was diluted to a concentration of 10–20 μg of cell protein per ml. Approximately 3.9 ml of the cell suspension was delivered to each culture tube containing 0.1 ml of the solution of test material or the solution of control material.[9] The test was terminated after 72 hours of incubation. The modification of this procedure used in some experiments provided a 24-hour period of incubation for the cells to attach before the drug was added with fresh medium.

All of these methods gave equivalent results; the only critical factor was the degree of cell multiplication. An experiment was considered satisfactory when the final cell protein was six times or more greater than the initial amount.

The extracts were tested at three dose levels of 100, 10, and 1 μg/ml. A material with an ED50[10] < 1 μg/ml (see calculation described later) was retested at lower concentrations; one with an ED50 ≥ 100 μg/ml was considered inactive and was not retested. In some cases five dose levels at closer intervals were used when a more precise endpoint was desired.

The determination of cytotoxicity was based on the inhibition of cell protein synthesis. Measurements were made colorimetrically at 660 mμ and include the initial protein per tube (Co), the final protein in control tubes (C), and the final protein in drug-treated tubes (T). The initial protein was determined on an aliquot of the inoculum or by using a series of control tubes at the time of drug addition. Internal controls included a protein standard (bovin serum albumin) and a group of tubes containing medium but no cells. The latter were necessary because it was found that 26–30 μg of protein from the medium adhered to each glass tube.

The equivalent of a T/C value, in this case (T–Co)/(C–Co),[11] and the slope representing the change in response for a tenfold change in concentration were determined for each dose.

Approximately 50–75 (n) plant extracts were tested simultaneously at three to five doses against a single group of controls. Each dose was run in duplicate tubes, and the number of controls was equal to $2\sqrt{n}$.

EVALUATION OF DATA

In Vivo Experiments

In this investigation six animals were used for each test group and $6\sqrt{n}$ animals were used as a common control group for "n" plant extracts tested simultaneously against the control. The establishment of test and control groups and the significance of the results were interpreted in accord with the statistical studies discussed by Abbott et al (9).

Selection of Materials

The minimum biologic standards of activity were established, based on the past experience, to select 1%–5% of material for further study. Two-stage sequential screening and confirmation procedures were designed with the following criteria for activity.

The two-stage sequence for Walker 256 carcinosarcoma employed the following acceptance limits:

Stage 1: $(T/C)_1 > 0.44$, reject
$(T/C)_1 \leq 0.44$, continued

[9] 6-Mercaptopurine (NSC-755) was used as the positive control; the control limit was not established.

[10] ED50 = the dose which inhibits protein synthesis to 50% of the control.

[11] It is assumed that this response varies linearly with the log of the concentration within defined limits of response. It was shown to be true by plotting a considerable amount of data (9).

Stage 2: $(T/C)_1 \times (T/C)_2 > 0.19$, reject
$(T/C)_1 \times (T/C)_2 \leq 0.19$, accept

The activity of plant extracts passing the two-stage sequence was to be confirmed. The confirmation test was performed on a new extract made from originally collected plant material or from a new crop of the same plant used for the first two tests. The plant materials were tested at four dose levels, one the same as that used in sequential test, one higher, and two lower spaced at about 0.3-log intervals. In order to confirm the sequential test, a T/C of 42% or less at one nontoxic dose level was required. If such a value was not obtained, a second dose response test was conducted. Failure to confirm in the second test series resulted in rejection of the material.

The two-stage test for L1210 and P388 leukemias had the following limits:

Stage 1: $(T/C)_1 < 1.25$, reject
$(T/C)_1 \geq 1.25$, continued
Stage 2: $(T/C)_1 \times (T/C)_2 < 1.56$, reject
$(T/C)_1 \times (T/C)_2 \geq 1.56$, accept

The confirmation procedure consists of a dose-response experiment at doses both higher and lower than the dose at which the sequential test was done. A material was considered to have confirmed activity if at least one of the four doses produced a $T/C \geq 125\%$.

Cell Culture

The acceptance limits of the cell culture test were set to choose 10% of materials tested for additional studies. A two-stage testing system was employed. A material passes the first stage if the ED50 is ≤ 15 μg/ml. In order to pass the second stage, a material must have an arithmetic mean from the first and second tests of ≤ 10 μg/ml. A material passing the second stage was to be confirmed with a new extract.

RESULTS

Data on a total of 500 species of Taiwan plants which failed the primary screening or confirmation tests on experimental tumor systems reported herein are presented in table 2. In general the materials were tested in two or three transplanted rodent tumor systems (L1210, P388, and Walker 256) below the maximum tolerated dose. The results provide the following information: route of administration, vehicle, day of sacrifice, day of first injection, frequency of injection, and total number of injections. Codes used in this report are given, as well as some additional codes which will appear in future reports.

The cell culture results are presented as one-line print rather than in fixed columns in the table.

Explanation of Abbreviations and Codes Used in Table 2

Host

02 = BDF_1 mouse
06 = CDF_1 mouse
50 = Randombred albino rat
90 = Cell culture

Test Sys. (test system)

KB = KB (Eagle)
LE = L1210 lymphoid leukemia
PS = P388 lymphocytic leukemia
WA = Walker 256 (subcutaneous) carcinosarcoma
WM = Walker 256 (intramuscular) carcinosarcoma

Screener (screening laboratory)

02 = Hazleton Laboratories
03 = Battelle Memorial Institute
05 = Wisconsin Alumni Research Foundation
06 = Arthur D. Little, Inc.
08 = Southern Research Institute
16 = University of Miami

Vehicle

2 = Saline
5 = Alkali diluted with saline
7 = Other
8 = Carboxymethylcellulose (CMC)
9 = Water
B = Propylene glycol
C = Acetone
E = Dimethylformamide
F = Dioxane
Y = Alkali diluted with CMC
S = Saline sonified

Route (route of administration)

1 = Intraperitoneal

Dose Reg. (dose regimen)

1 = Once a day

Day 1st Inj. (day of first injection)

Numbers 1 to 9 = day of first injection

No. of Inj. (number of injections)

Numbers 01 to 99 = total number of injections
Z = until death

Day of Sac. (day of sacrifice)

Numbers 01 to 99 = day experiment is completed by sacrificing animals
Z = until death

Dose

Dose per injection in mg/kg

Survivors

Number of animals surviving out of number started on tests as defined in individual protocols

Animal Wt. Diff. (animal weight difference)

Average weight change of treated host minus average weight change of control host (expressed in g and exclusive of tumor weight)

Tumor Wt. or Survival (test/control)

(1) = Tumor weight: the mean tumor weight of the test animals (T); the mean tumor weight of the control animals (C). The units are specified in the individual protocols.

(2) = Survival (days): the mean or median survival time of the test animals (T); the mean or median survival time of the control animals (C).

Percent

Percent = treated/control × 100

Slope

Change of response for each 1-log change of dose

ED50

The dose, in μg/ml, that inhibits growth to 50% of control growth; expressed as factors of appropriate power of 10, ie, $1.1 \times 10(-1) = 0.11$ μg/ml.

M = more than

Plant Parts and Extracts

Bk = Bark
Fl = Flower
Fr = Fruit
Lf = Leaf
Pl = Entire plant
Px = Entire plant without roots
Rt = Root
Sd = Seed
St = Stems
Aq = Aqueous extract
Aq/EtOH = Aqueous/ethanol (50% v/v) extract
EtOH = Ethanol extract

Table 2 *In Vitro* And *In Vivo* Data On Taiwan Plant Extracts

NSC NO.	BOTANICAL NAME	HOST	TEST SYS.	SCREENER	VEHICLE	ROUTE	DOSE REG.	DAY 1ST INJ.	NO. OF INJ.	DAY OF SAC.	DOSE	SURVIVORS	ANIMAL WT. DIFF.	TUMOR WT. OR SURVIVAL (T./C.)	PERCENT
B672866	Acacia decurrens Willd.	02	LE	02	2	1	1	1	09	30	75.0	6/6	- 0.6	9.5/ 9.6	98
	var. mollis Benth.	02	PS	02	2	1	1	1	10	30	75.0	6/6	- 1.5	11.5/12.0	95
	Leguminosae	90	KB	16	2						Slope	-0.41	ED50	5.6 x 10(1)	
	Lf St, AQ/EtOH														
	Liu-kuei, 11/66														
B626233	Acalypha wilkesiana	02	LE	03	8	1	1	1	15	Z	400.0	6/6	- 3.3	8.8/ 8.7	101
	Muell. Arg.	50	WM	03	8	1	1	3	04	07	400.0	7/7	-10.0	8.2/ 9.3	88
	var. macafeana Hort.	90	KB	16	5						Slope	-0.64	ED50	4.2 x 10(1)	
	Euphorbiaceae														
	Lf St, AQ/EtOH														
	Hengchun, 11/64														
B672882	Acalypha sp.	02	LE	02	2	1	1	1	09	30	400.0	6/6	- 1.6	9.5/ 9.2	103
	Euphorbiaceae	02	PS	02	2	1	1	1	10	30	400.0	5/6	- 2.3	10.0/11.0	90
	Lf St, AQ/EtOH	90	KB	16	5						Slope	-0.41	ED50	1.1 x 10(2)	
	Hengchun, 11/65														
B672822	Acanthopanax trifoliatus	02	LE	02	2	1	1	1	09	30	400.0	6/6	- 2.5	8.7/ 8.4	103
	(Linn.) Merr.	02	PS	02	2	1	1	1	10	30	200.0	6/6	- 1.3	11.5/11.0	104
	Araliaceae	90	KB	16	5						Slope	-1.17	ED50	2.8 x 10(1)	
	Lf St, AQ/EtOH														
	Mt. Ch'i-hsing, 11/66														
B672821	Acer insulare Mak.	02	LE	02	2	1	1	1	09	30	35.0	6/6	- 2.5	8.0/ 8.6	93
	Aceraceae	02	PS	02	2	1	1	1	10	30	75.0	6/6	- 3.4	9.5/11.0	86
	Pl, AQ/EtOH	90	KB	16	5						Slope	-1.25	ED50	3.1 x 10(1)	
	Mt. Ch'i-hsing, 11/66														
B672786	Acer serrulatum Hay.	02	LE	06	2	1	1	1	09	30	400.0	6/6	- 1.3	9.3/ 8.5	109
	Aceraceae	06	PS	06	2	1	1	1	10	30	400.0	6/6	- 0.5	11.0/12.0	91
	Lf St, AQ/EtOH	90	KB	06	9								ED50	M1.0 x 10(2)	
	Mt. Ch'i-hsing, 11/66														

Table 2 *In Vitro* And *In Vivo* Data On Taiwan Plant Extracts

NSC NO.	BOTANICAL NAME	HOST	TEST SYS.	SCREENER	VEHICLE	ROUTE	DOSE REG.	DAY 1ST INJ.	NO. OF INJ.	DAY OF SAC.	DOSE	SURVIVORS	ANIMAL WT. DIFF.	TUMOR WT. OR SURVIVAL (T./C.)	PERCENT
B672032	Achyranthes longifolia Mak.	02	LE	03	2	1	1	1	09	30	200.0	6/6	- 0.6	9.0/ 8.5	105
	Amaranthaceae	02	PS	03	2	1	1	1	10	30	200.0	6/6	- 1.3	11.3/ 9.1	124
	Lf St, AQ/EtOH	90	KB	16	2								ED50	M1.0 x 10(2)	
	Mt. Ali, 11/66														
B672787	Acorus gramineus Soland.	02	LE	06	2	1	1	1	09	30	400.0	6/6	- 1.1	7.8/ 8.5	91
	Araceae	06	PS	06	2	1	1	1	10	30	400.0	5/6	- 0.5	10.5/12.0	87
	Pl, AQ/EtOH	90	KB	06	9								ED50	M1.0 x 10(2)	
	Chiayi, 11/66														
B672892	Actinidia callosa Lindl.	02	LE	02	2	1	1	1	09	30	150.0	5/6	- 1.3	9.0/ 9.3	96
	var. formosana	02	PS	02	2	1	1	1	10	30	150.0	5/6	- 2.5	10.5/12.0	87
	Finet & Gagnep.	90	KB	16	5						Slope	-0.96	ED50	3.4 x 10(1)	
	Actinidiaceae														
	Lf St, AQ/EtOH														
	Mt. Ch'i-hsing, 11/66														
B626465	Actinodaphne mushaensis	02	LE	03	8	1	1	1	09	30	400.0	6/6	- 2.2	8.7/ 8.9	97
	Hay.	50	WA	03	8	1	1	3	04	07	400.0	7/7	- 6.0	6.7/ 9.7	69
	Lauraceae	90	KB	16	5						Slope	-0.91	ED50	3.8 x 10(1)	
	Lf St, AQ/EtOH														
	Mt. Ta-hsue, 01/67														
B672054	Actinodaphne nantoensis	02	LE	03	8	1	1	1	09	30	200.0	6/6	- 0.4	8.7/ 8.8	98
	Hay.	02	PS	03	8	1	1	1	10	30	200.0	6/6	- 2.1	9.7/10.1	96
	Lauraceae	90	KB	16	F						Slope	-1.18	ED50	2.8 x 10(1)	
	Lf St, AQ/EtOH														
	Liu-kuei, 11/66														
B626314	Actinophloeus angustifolia	02	LE	08	8	1	1	1	15	Z	400.0	5/6	- 4.8	7.6/ 7.6	100
	Becc.	50	WM	08	8	1	1	3	04	07	400.0	5/6	0	5.2/ 8.6	60
	Palmae	90	KB	16	2								ED50	M1.0 x 10(2)	
	Lf St, AQ/EtOH														
	Hengchun, 11/65														

Table 2 *In Vitro* And *In Vivo* Data On Taiwan Plant Extracts

NSC NO.	BOTANICAL NAME	HOST	TEST SYS.	SCREENER	VEHICLE	ROUTE	DOSE REG.	DAY 1ST INJ.	NO. OF INJ.	DAY OF SAC.	DOSE	SURVIVORS	ANIMAL WT. DIFF.	TUMOR WT. OR SURVIVAL (T./C.)	PERCENT
B603844	Adenanthera microsperma L.	02	LE	05	2	1	1	1	15	Z	200.0	6/6	- 2.8	9.3/ 9.2	101
	Leguminosae	50	WM	05	2	1	1	3	04	07	200.0	6/6	- 6.0	4.0/ 6.5	61
	Lf St, AQ/EtOH	90	KB	16	5						Slope	-1.00	ED50	3.2 x 10(1)	
	Hengchun, 1965														
B603845	Adenanthera pavonina L.	02	LE	05	2	1	1	1	15	Z	400.0	6/6	- 1.7	9.7/ 9.2	105
	Leguminosae	50	WM	05	2	1	1	3	04	07	400.0	5/6	- 3.0	4.2/ 6.5	64
	Lf St, AQ/EtOH	90	KB	16	5								ED50	M1.0 x 10(2)	
	Taiwan, 1965														
B672167	Adenophora morrisonensis	06	LE	06	2	1	1	1	09	30	400.0	4/6	- 2.9	9.0/ 8.9	101
	Hay.	02	PS	06	2	1	1	1	10	30	400.0	4/6	- 1.6	11.5/12.0	95
	Campanulaceae	90	KB	06	B								ED50	M1.0 x 10(2)	
	Pl, AQ/EtOH														
	Mt. Ho-huan, 07/68														
B603846	Adina racemosa Miq.	02	LE	05	2	1	1	1	15	Z	400.0	6/6	0.2	9.3/ 9.2	101
	Rubiaceae	50	WM	05	2	1	1	3	04	07	400.0	5/6	- 4.0	7.4/ 6.5	113
	Lf St, AQ/EtOH	90	KB	16	5								ED50	M1.0 x 10(2)	
	Hengchun, 1965														
B603755	Ageratum conyzoides L.	02	LE	05	2	1	1	1	Z	Z	500.0	6/6	- 0.4	9.0/ 9.1	98
	Compositae	50	WM	05	2	1	1	3	04	07	500.0	6/6	- 1.0	8.8/ 9.7	90
	Pl, EtOH	90	KB	06	B								ED50	M1.0 x 10(2)	
	Taipei, 1965														
B672896	Ageratum houstonianum Mill.	02	LE	02	2	1	1	1	09	30	400.0	5/6	0.2	9.0/ 9.4	95
	Compositae	02	PS	02	2	1	1	1	10	30	400.0	5/6	- 2.2	9.5/10.5	90
	Pl, AQ/EtOH	90	KB	16	5								ED50	M1.0 x 10(2)	
	Mt. Ch'i-hsing, 11/66														

Table 2 *In Vitro* And *In Vivo* Data On Taiwan Plant Extracts

NSC NO.	BOTANICAL NAME	HOST	TEST SYS.	SCREENER	VEHICLE	ROUTE	DOSE REG.	DAY 1ST INJ.	NO. OF INJ.	DAY OF SAC.	DOSE	SURVIVORS	ANIMAL WT. DIFF.	TUMOR WT. OR SURVIVAL (T./C.)	PERCENT
B672180	Agrostis morrisonensis Hay.	02	LE	06	2	1	1	1	09	30	400.0	5/6	- 0.8	9.2/ 9.4	97
	Gramineae	02	PS	06	2	1	1	1	10	30	200.0	6/6	- 0.1	10.0/ 9.0	111
	Pl, AQ/EtOH	90	KB	06	B								ED50	Ml.0 x 10(2)	
	Mt. Ho-huan, 07/68														
B672181	Aira kawakamii Hay.	02	LE	06	2	1	1	1	09	30	400.0	6/6	- 0.6	8.5/ 9.4	90
	Gramineae	02	PS	06	2	1	1	1	10	30	200.0	6/6	- 0.5	9.0/ 9.0	100
	Pl, AQ/EtOH	90	KB	06	B								ED50	Ml.0 x 10(2)	
	Mt. Ho-huan, 07/68														
B603848	Albizzia falcata Back.	02	LE	05	2	1	1	1	15	Z	30.0	5/6	- 3.6	8.0/ 9.2	86
	Leguminosae	50	WM	05	2	1	1	3	04	07	7.0	6/6	-14.0	4.3/ 6.1	70
	Lf St, AQ/EtOH	90	KB	16	5						Slope	-0.53	Ml.0 x 10(2)		
	Hengchun, 1966														
B626447	Albizzia lebbek Benth.	02	LE	06	9	1	1	1	09	30	200.0	6/6	- 3.7	8.5/ 9.4	90
	Leguminosae	50	WM	06	9	1	1	3	04	07	400.0	4/6	-11.0	4.7/ 6.6	71
	Lf, AQ/EtOH	90	KB	06	E								ED50	Ml.0 x 10(2)	
	Hengchun, 11/65														
B626448	Albizzia lebbek Benth.	06	LE	06	9	1	1	1	09	30	5.0	6/6	- 5.0	7.8/ 8.4	92
	Leguminosae	50	WM	06	2	1	1	3	04	07	5.0	6/6	- 7.0	6.3/ 7.7	81
	St, AQ/EtOH	90	KB	06	E						Slope	-0.83	ED50	3.2 x 10(1)	
	Hengchun, 11/66														
B626250	Albizzia lebbek Benth.	02	LE	03	2	1	1	1	15	Z	30.0	6/6	- 4.8	7.8/ 8.7	89
	Leguminosae	50	WA	03	2	1	1	3	04	07	25.0	6/6	- 8.0	7.4/ 8.3	89
	Pl, AQ/EtOH	02	PS	03	2	1	1	1	10	30	40.0	6/6	- 3.4	9.0/10.0	90
	Hengchun, 11/64	90	KB	16	2						Slope	-0.74	ED50	3.8 x 10(1)	

Table 2 *In Vitro* And *In Vivo* Data On Taiwan Plant Extracts

NSC NO.	BOTANICAL NAME	HOST	TEST SYS.	SCREENER	VEHICLE	ROUTE	DOSE REG.	DAY 1ST INJ.	NO. OF INJ.	DAY OF SAC.	DOSE	SURVIVORS	ANIMAL WT. DIFF.	TUMOR WT. OR SURVIVAL (T./C.)	PERCENT
B672768	Aleurites fordii Hemsl.	02	LE	05	2	1	1	1	09	30	200.0	6/6	- 1.3	9.0/ 9.7	92
	Euphorbiaceae	02	PS	05	2	1	1	1	10	29	200.0	6/6	- 2.1	10.5/ 9.5	110
	Lf St, AQ/EtOH	90	KB	16	5						Slope	-0.69	ED50	5.7 x 10(1)	
	Liu-kuei, 11/66														
B626445	Aleurites montana Wils.	02	LE	06	9	1	1	1	09	30	25.0	5/6	- 1.1	8.6/ 8.8	97
	Euphorbiaceae	50	WM	06	2	1	1	3	04	07	50.0	6/6	- 5.0	6.6/ 7.6	86
	Bk, AQ/EtOH	90	KB	06	E						Slope	-0.38	ED50	9.1 x 10(1)	
	Hengchun, 11/65														
B626446	Aleurites montana Wils.	02	LE	06	9	1	1	1	09	30	100.0	6/6	- 6.3	8.5/ 8.8	96
	Euphorbiaceae	50	WM	06	2	1	1	3	04	07	100.0	6/6	- 6.0	5.7/ 7.6	75
	Fr, AQ/EtOH	90	KB	06	E								ED50	M1.0 x 10(2)	
	Hengchun, 11/65														
B626779	Aleurites montana Wils.	02	LE	05	2	1	1	1	09	30	100.0	6/6	- 1.3	8.7/ 9.0	96
	Euphorbiaceae	02	PS	05	2	1	1	1	10	33	100.0	5/6	- 4.8	12.0/11.0	109
	Lf, AQ/EtOH	90	KB	16	2						Slope	-0.55	ED50	M1.0 x 10(2)	
	Hengchun, 11/64														
B626234	Aleurites montana Wils.	02	LE	03	8	1	1	1	15	Z	400.0	6/6	- 0.7	8.3/ 8.7	95
	Euphorbiaceae	50	WM	03	8	1	1	3	04	07	400.0	6/6	- 3.0	8.5/10.2	83
	Lf St, AQ/EtOH	02	PS	03	8	1	1	1	10	30	400.0	6/6	- 0.9	9.5/10.0	95
	Mt. Ali, 11/64	90	KB	16	5								ED50	M1.0 x 10(2)	
B603850	Aleurites trisperma Blanco	02	LE	05	2	1	1	1	15	Z	50.0	6/6	- 3.2	9.5/ 9.2	103
	Euphorbiaceae	50	WM	05	2	1	1	3	04	07	50.0	6/6	-12.0	5.0/ 6.5	76
	Lf, AQ/EtOH	90	KB	16	5						Slope	-0.51	ED50	M1.0 x 10(2)	
	Hengchun, 1965														

Table 2 *In Vitro* And *In Vivo* Data On Taiwan Plant Extracts

NSC NO.	BOTANICAL NAME	HOST	TEST SYS.	SCREENER	VEHICLE	ROUTE	DOSE REG.	DAY 1ST INJ.	NO. OF INJ.	DAY OF SAC.	DOSE	SURVIVORS	ANIMAL WT. DIFF.	TUMOR WT. OR SURVIVAL (T./C.)	PERCENT
B672038	Allamanda neriifolia Hook.	02	LE	03	8	1	1	1	09	30	200.0	6/6	- 0.7	8.5/ 8.8	96
	Apocynaceae	02	PS	03	8	1	1	1	10	30	200.0	6/6	- 1.5	9.7/10.1	96
	Lf St, AQ/EtOH	90	KB	16	2								ED50	Ml.0 x 10(2)	
	Liu-kuei, 11/66														
B672817	Alniphyllum pterospermum	02	LE	06	2	1	1	1	09	30	20.0	6/6	- 3.4	9.0/ 9.8	91
	Matsum.	02	PS	06	2	1	1	1	10	30	20.0	5/6	- 4.4	9.5/11.0	86
	Styracaceae	90	KB	06	9								ED50	Ml.0 x 10(2)	
	Lf St, AQ/EtOH														
	Mt. Ch'i-hsing, 11/66														
B672761	Alnus japonica	02	LE	05	2	1	1	1	09	30	400.0	6/6	- 2.8	9.5/ 9.9	95
	(Thunb.) Steud.	02	PS	05	2	1	1	1	10	29	400.0	6/6	- 1.8	9.0/ 9.5	94
	Betulaceae	90	KB	16	2								ED50	Ml.0 x 10(2)	
	Lf St, AQ/EtOH														
	Liu-kuei, 11/66														
B672165	Alpinia japonica	06	LE	06	2	1	1	1	09	30	100.0	6/6	- 2.8	8.2/ 8.3	98
	(Thunb.) Miq.	06	PS	06	2	1	1	1	10	30	100.0	6/6	- 2.9	8.0/ 9.0	88
	Zingiberaceae	90	KB	06	B								ED50	Ml.0 x 10(2)	
	Pl, AQ/EtOH														
	Mt. Ta-hsue, 01/67														
B672124	Alsophila fairiei Christ.	02	LE	08	2	1	1	1	09	30	400.0	6/6	- 1.3	9.8/ 9.4	104
	Cyatheaceae	02	PS	08	2	1	1	1	10	30	400.0	5/5	- 1.6	11.0/10.0	110
	Lf St, AQ/EtOH	90	KB	16	2								ED50	Ml.0 x 10(2)	
	Hengchun, 11/65														
B672077	Alsophila pustulosa Christ.	02	LE	08	2	1	1	1	09	30	75.0	6/6	- 2.8	8.3/ 9.4	88
	Cyatheaceae	02	PS	08	2	1	1	1	10	30	38.0	6/6	- 1.0	12.0/11.0	109
	Lf St, AQ/EtOH	90	KB	16	5						Slope	-1.18	ED50	2.8 x 10(1)	
	Liu-kuei, 11/66														

Table 2 *In Vitro* And *In Vivo* Data On Taiwan Plant Extracts

NSC NO.	BOTANICAL NAME	HOST	TEST SYS.	SCREENER	VEHICLE	ROUTE	DOSE REG.	DAY 1ST INJ.	NO. OF INJ.	DAY OF SAC.	DOSE	SURVIVORS	ANIMAL WT. DIFF.	TUMOR WT. OR SURVIVAL (T./C.)	PERCENT
B672121	Alternanthera nodiflora	02	LE	08	2	1	1	1	09	30	400.0	6/6	- 3.7	8.3/ 9.4	88
	R. Br.	02	PS	08	2	1	1	1	10	30	400.0	5/6	- 4.1	11.0/10.0	110
	Amaranthaceae	90	KB	16	2								ED50	Ml.0 x 10(2)	
	Pl, AQ/EtOH														
	Taiwan, 11/65														
B672895	Amorphophallus henryi Br.	02	LE	02	2	1	1	1	09	30	400.0	6/6	- 0.6	9.2/ 9.4	97
	Araceae	02	PS	02	2	1	1	1	10	30	400.0	6/6	- 2.8	12.0/10.5	114
	Pl, AQ/EtOH	90	KB	16	2								ED50	Ml.0 x 10(2)	
	Mt. Ch'i-hsing, 11/66														
B672098	Ampelopsis brevipedunculata	02	LE	08	2	1	1	1	09	30	400.0	6/6	- 2.2	9.8/ 9.9	98
	Trautv.	02	PS	08	2	1	1	1	10	30	400.0	5/5	- 2.8	11.0/11.0	100
	Vitaceae	90	KB	16	5								ED50	Ml.0 x 10(2)	
	Lf St, AQ/EtOH														
	Chiayi, 11/66														
B626472	Ampelopsis brevipedunculata	02	LE	03	8	1	1	1	09	30	400.0	5/6	- 3.9	8.8/ 8.0	110
	(Maxim.) Trautv.	50	WA	03	8	1	1	3	04	07	200.0	5/6	-12.0	6.5/10.9	59
	var. hancei (Planch.) Li	90	KB	16	5								ED50	Ml.0 x 10(2)	
	Vitaceae														
	Lf St, AQ/EtOH														
	Liu-kuei, 01/67														
B626296	Anaphalis morrisonicola	02	LE	08	8	1	1	1	15	Z	400.0	6/6	- 3.3	7.3/ 7.6	96
	Hay.	50	WM	08	Y	1	1	3	04	07	400.0	6/6	0	4.7/ 8.7	54
	Compositae	90	KB	16	5						Slope	-0.94	ED50	3.7 x 10(1)	
	Pl, AQ/EtOH														
	Mt. Ali, 01/67														
B672027	Anemone matsudai Hay.	02	LE	03	2	1	1	1	09	30	85.0	6/6	- 2.6	9.2/ 8.6	108
	Ranunculaceae	02	PS	03	2	1	1	1	10	30	85.0	6/6	- 4.9	9.8/ 9.1	107
	Pl, AQ/EtOH	90	KB	16	2						Slope	-0.33	ED50	Ml.0 x 10(2)	
	Mt. Ali, 11/66														

Table 2 *In Vitro* And *In Vivo* Data On Taiwan Plant Extracts

NSC NO.	BOTANICAL NAME	HOST	TEST SYS.	SCREENER	VEHICLE	ROUTE	DOSE REG.	DAY 1ST INJ.	NO. OF INJ.	DAY OF SAC.	DOSE	SURVIVORS	ANIMAL WT. DIFF.	TUMOR WT. OR SURVIVAL (T./C.)	PERCENT
B672196	Anemone vitifolia	02	LE	06	2	1	1	1	09	30	400.0	6/6	0	9.2/ 9.4	97
	Buch.-Ham.	02	PS	06	2	1	1	1	10	30	400.0	6/6	- 0.6	11.5/11.0	104
	Ranunculaceae	90	KB	06	B								ED50	M1.0 x 10(2)	
	Pl, AQ/EtOH														
	Mt. Ho-huan, 07/68														
B672026	Annona cherimola Mill.	02	LE	03	8	1	1	1	09	30	200.0	6/6	- 3.2	8.5/ 8.6	98
	Annonaceae	02	PS	03	8	1	1	1	10	30	200.0	5/6	- 3.3	8.8/ 9.1	96
	Lf St, AQ/EtOH	90	KB	16	F						Slope	-1.08	ED50	2.5 x 10(1)	
	Mt. Ali, 11/65														
B626217	Annona montana Macf.	02	LE	03	2	1	1	1	15	Z	100.0	6/6	- 1.4	10.7/ 8.7	122
	Annonaceae	50	WM	03	2	1	1	3	04	07	100.0	7/7	- 1.0	7.0/12.0	58
	Lf St, AQ/EtOH	90	KB	16	2						Slope	-0.10	ED50	M1.0 x 10(2)	
	Hengchun, 11/64														
B602851	Annona reticulata L.	02	LE	05	2	1	1	1	15	Z	100.0	6/6	- 0.9	10.2/ 9.2	110
	Annonaceae	50	WM	05	2	1	1	3	04	07	100.0	6/6	- 8.0	4.6/ 6.5	70
	Lf St, AQ/EtOH	90	KB	16	5						Slope	-0.17	ED50	M1.0 x 10(2)	
	Hengchun, 1965														
B603852	Antidesma kotoensis Kaneh.	02	LE	05	2	1	1	1	15	Z	400.0	6/6	- 2.0	9.5/ 9.2	103
	Euphorbiaceae	50	WM	05	2	1	1	3	04	07	400.0	6/6	- 9.0	4.1/ 6.5	63
	Lf St, AQ/EtOH	90	KB	16	5						Slope	-1.0	ED50	3.1 x 10(1)	
	Hengchun, 1965														
B672827	Araiostegia perdurans	02	LE	02	2	1	1	1	09	30	100.0	6/6	- 0.9	8:5/ 8.7	97
	(Christ.) Copel.	02	PS	02	2	1	1	1	10	30	200.0	6/6	- 3.0	11.0/11.0	100
	Davalliaceae	90	KB	16	2						Slope	-1.22	ED50	3.0 x 10(1)	
	Pl, AQ/EtOH														
	Mt. Ali, 11/66														

Table 2 *In Vitro* And *In Vivo* Data On Taiwan Plant Extracts

NSC NO.	BOTANICAL NAME	HOST	TEST SYS.	SCREENER	VEHICLE	ROUTE	DOSE REG.	DAY 1ST INJ.	NO. OF INJ.	DAY OF SAC.	DOSE	SURVIVORS	ANIMAL WT. DIFF.	TUMOR WT. OR SURVIVAL (T./C.)	PERCENT
B672759	Aralia decaisneana Hance	02	LE	05	2	1	1	1	09	30	150.0	5/6	- 3.4	8.6/ 9.7	88
	Araliaceae	02	PS	05	2	1	1	1	10	30	75.0	6/6	- 3.4	11.5/10.0	115
	Lf St, AQ/EtOH	90	KB	16	2								ED50	Ml.0 x 10(2)	
	Chiayi, 11/66														
B626221	Araucaria bidwillii Hook.	02	LE	03	8	1	1	1	15	Z	200.0	6/6	- 1.6	8.8/ 8.3	106
	Pinaceae	50	WM	03	8	1	1	3	04	07	200.0	6/6	- 3.0	10.8/14.5	74
	Lf St, AQ/EtOH	90	KB	16	5								ED50	Ml.0 x 10(2)	
	Hengchun, 11/64														
B626256	Archontophoenix alexandrae	02	LE	03	8	1	1	1	15	Z	400.0	6/6	- 1.0	8.3/ 8.7	95
	Wendl. & Drude	50	WM	03	8	1	1	3	04	07	400.0	7/7	1.0	4.4/ 4.1	107
	Palmae	90	KB	16	5								ED50	Ml.0 x 10(2)	
	Lf St, AQ/EtOH														
	Hengchun, 11/64														
B626310	Ardisia cornudentata Mez	02	LE	08	8	1	1	1	15	Z	30.0	6/6	- 2.7	7.8/ 8.4	92
	Myrsinaceae	50	WM	08	8	1	1	3	04	07	30.0	6/6	- 8.0	5.8/ 8.0	72
	Pl, AQ/EtOH	90	KB	16	5						Slope	-0.92	ED50	1.9 x 10(1)	
	Mt. Ali, 01/67														
B672840	Ardisia quinquegona Bl.	02	LE	02	2	1	1	1	09	30	150.0	6/6	- 3.2	10.5/ 8.7	120
	Myrsinaceae	02	PS	02	2	1	1	1	10	30	150.0	5/6	- 3.1	11.0/12.0	91
	Lf St, AQ/EtOH	90	KB	16	5						Slope	-1.28	ED50	3.1 x 10(1)	
	Mt. Ch'i-hsing, 11/66														
B603853	Areca catechu L.	02	LE	05	2	1	1	1	15	Z	400.0	6/6	- 1.4	9.5/ 9.2	103
	Palmae	50	WM	05	2	1	1	3	04	07	400.0	6/6	-14.0	4.0/ 6.5	61
	Lf St, AQ/EtOH	90	KB	16	5						Slope	-0.74	ED50	6.8 x 10(1)	
	Hengchun, 1965														

Table 2 *In Vitro* And *In Vivo* Data On Taiwan Plant Extracts

NSC NO.	BOTANICAL NAME	HOST	TEST SYS.	SCREENER	VEHICLE	ROUTE	DOSE REG.	DAY 1ST INJ.	NO. OF INJ.	DAY OF SAC.	DOSE	SURVIVORS	ANIMAL WT. DIFF.	TUMOR WT. OR SURVIVAL (T./C.)	PERCENT
B672110	Arenga engleri Becc.	02	LE	08	2	1	1	1	09	30	400.0	6/6	- 1.9	9.0/ 9.4	95
	Palmae	02	PS	08	2	1	1	1	10	30	400.0	6/6	- 1.6	11.5/11.0	104
	Lf St, AQ/EtOH	90	KB	16	2						Slope	-0.10	ED50	M1.0 x 10(2)	
	Hengchun, 11/65														
B672090	Aristolochia cucurbitifolia	02	LE	08	2	1	1	1	09	30	200.0	6/6	- 3.2	8.5/ 9.7	87
	Hay.	02	PS	08	2	1	1	1	10	30	400.0	6/6	- 3.8	10.0/11.0	90
	Aristolochiaceae	90	KB	16	5								ED50	M1.0 x 10(2)	
	Pl, AQ/EtOH														
	Chiayi, 11/66														
B626291	Aristolochia shimadae Hay.	02	LE	08	8	1	1	1	15	Z	400.0	4/6	- 4.8	8.5/ 7.6	111
	Aristolochiaceae	50	WM	08	8	1	1	3	04	07	400.0	6/7	- 1.0	4.2/ 6.7	62
	Pl, AQ/EtOH	90	KB	16	5						Slope	-0.74	ED50	4.5 x 10(1)	
	Hengchun, 11/65														
B626218	Artabotrys uncinatus Merr.	02	LE	03	2	1	1	1	15	Z	50.0	6/6	- 2.0	8.2/ 8.3	98
	Annonaceae	50	WM	03	2	1	1	3	04	07	50.0	6/6	- 6.0	10.5/14.5	72
	Lf St, AQ/EtOH	90	KB	16	5								ED50	M1.0 x 10(2)	
	Hengchun, 11/64														
B622762	Artemisia capillaris Thunb.	02	LE	05	2	1	1	1	09	30	400.0	6/6	- 0.5	9.7/ 9.9	97
	Compositae	02	PS	05	2	1	1	1	10	29	400.0	6/6	- 0.7	10.0/ 9.5	105
	Pl, AQ/EtOH	90	KB	16	2						Slope	-0.35	ED50	M1.0 x 10(2)	
	Mt. Ali, 11/66														
B672168	Artemisia kawakamii Hay.	06	LE	06	2	1	1	1	09	30	400.0	6/6	- 0.6	8.8/ 8.9	98
	Compositae	02	PS	06	2	1	1	1	10	30	400.0	6/6	0.5	12.0/12.0	100
	Rt St Fr, AQ/EtOH	90	KB	06	B								ED50	M1.0 x 10(2)	
	Mt. Ho-huan, 07/68														

Table 2 *In Vitro* And *In Vivo* Data On Taiwan Plant Extracts

NSC NO.	BOTANICAL NAME	HOST	TEST SYS.	SCREENER	VEHICLE	ROUTE	DOSE REG.	DAY 1ST INJ.	NO. OF INJ.	DAY OF SAC.	DOSE	SURVIVORS	ANIMAL WT. DIFF.	TUMOR WT. OR SURVIVAL (T./C.)	PERCENT
B672169	Artemisia oligocarpa Hay.	06	LE	06	2	1	1	1	09	30	400.0	6/6	- 0.9	9.2/ 8.9	103
	Compositae	02	PS	06	2	1	1	1	10	30	400.0	6/6	1.4	12.0/12.0	100
	Pl, AQ/EtOH	90	KB	06	B								ED50	Ml.0 x 10(2)	
	Mt. Ho-huan, 07/68														
B672880	Artemisia sp.	02	LE	02	2	1	1	1	09	30	400.0	6/6	- 0.6	9.0/ 9.2	97
	Compositae	02	PS	02	2	1	1	1	10	30	400.0	5/6	- 2.7	10.0/11.0	90
	Lf St, AQ/EtOH	90	KB	16	2								ED50	Ml.0 x 10(2)	
	Hengchun, 11/65														
B603856	Artocarpus integra Merr.	02	LE	05	2	1	1	1	15	Z	400.0	6/6	- 1.9	9.7/ 9.2	105
	Moraceae	50	WM	05	2	1	1	3	04	07	400.0	5/6	- 7.0	3.9/ 5.8	67
	Lf, AQ/EtOH	90	KB	16	5						Slope	-0.54	ED50	Ml.0 x 10(2)	
	Hengchun, 1965														
B603855	Artocarpus integra Merr.	02	LE	05	2	1	1	1	15	Z	400.0	6/6	- 1.4	9.5/ 9.2	103
	Moraceae	50	WM	05	2	1	1	3	04	07	400.0	6/6	- 5.0	4.4/ 5.8	75
	Lf St, AQ/EtOH	90	KB	16	5								ED50	Ml.0 x 10(2)	
	Hengchun, 1965														
B603857	Artocarpus rigida Bl.	02	LE	05	2	1	1	1	15	Z	100.0	6/6	0.9	9.5/ 9.7	97
	Moraceae	50	WM	05	2	1	1	3	04	07	500.0	5/6	- 3.0	4.2/ 7.0	60
	Lf St, AQ/EtOH	02	PS	03	2	1	1	1	09	30	100.0	6/6	- 0.6	13.0/11.5	113
	Hengchun, 1965	90	KB	16	5								ED50	Ml.0 x 10(2)	
B672087	Arundo formosana Hack.	02	LE	08	2	1	1	1	09	30	200.0	6/6	- 0.8	9.2/ 9.7	94
	Gramineae	02	PS	08	2	1	1	1	10	30	400.0	6/6	- 1.8	10.5/11.0	95
	Lf St, Aq/EtOH	90	KB	16	5						Slope	-0.34	ED50	Ml.0 x 10(2)	
	Chiayi, 11/65														

Table 2 *In Vitro* And *In Vivo* Data On Taiwan Plant Extracts

NSC NO.	BOTANICAL NAME	HOST	TEST SYS.	SCREENER	VEHICLE	ROUTE	DOSE REG.	DAY 1ST INJ.	NO. OF INJ.	DAY OF SAC.	DOSE	SURVIVORS	ANIMAL WT. DIFF.	TUMOR WT. OR SURVIVAL (T./C.)	PERCENT
B626222	Asclepias sp.	02	LE	03	2	1	1	1	15	Z	400.0	6/6	- 1.3	8.2/ 8.3	98
	Asclepiadaceae	50	WM	03	2	1	1	3	04	07	400.0	6/6	- 1.0	14.5/14.5	100
	Lf St, AQ/EtOH	90	KB	16	5								ED50	M1.0 x 10(2)	
	Hengchun, 11/64														
B672836	Asparagus officinalis L.	02	LE	02	2	1	1	1	09	30	400.0	6/6	- 0.5	9.5/ 8.7	109
	Liliaceae	02	PS	02	2	1	1	1	10	30	200.0	4/4	0.6	11.0/11.0	100
	Pl, AQ/EtOH	90	KB	16	2								ED50	M1.0 x 10(2)	
	Mt. Ta-hsue, 01/67														
B672838	Aspidixia articulata	02	LE	02	2	1	1	1	09	30	400.0	6/6	- 3.0	9.0/ 8.7	103
	Van Tiegh.	02	PS	02	2	1	1	1	10	30	200.0	6/6	- 1.5	12.5/11.0	113
	Loranthaceae	90	KB	16	2						Slope	-1.21	ED50	3.0 x 10(1)	
	Lf St, AQ/EtOH														
	Mt. Ta-hsue, 01/67														
B672031	Asplenium ensiforme Wall.	02	LE	03	2	1	1	1	09	30	200.0	6/6	- 0.8	8.7/ 8.5	102
	Polypodiaceae	02	PS	03	2	1	1	1	10	30	200.0	6/6	- 1.6	10.8/ 9.1	118
	Pl, AQ/EtOH	90	KB	16	F						Slope	-1.22	ED50	2.9 x 10(1)	
	Mt. Ali, 11/66														
B603858	Asplenium sp.	02	LE	05	2	1	1	1	15	Z	200.0	5/6	- 2.8	9.0/ 9.2	97
	Polypodiaceae	50	WM	05	2	1	1	3	04	07	200.0	6/6	- 4.0	4.7/ 5.8	81
	Lf St, AQ/EtOH	90	KB	16	2								ED50	M1.0 x 10(2)	
	Hengchun, 1965														
B672051	Asplenium unilaterale Lam.	02	LE	03	8	1	1	1	09	30	200.0	6/6	- 0.1	8.8/ 8.8	100
	Polypodiaceae	02	PS	03	8	1	1	1	10	30	200.0	6/6	- 1.1	10.3/10.1	101
	Pl, AQ/EtOH	90	KB	16	2								ED50	M1.0 x 10(2)	
	Mt. Ta-hsue, 11/66														

Table 2 *In Vitro* And *In Vivo* Data On Taiwan Plant Extracts

NSC NO.	BOTANICAL NAME	HOST	TEST SYS.	SCREENER	VEHICLE	ROUTE	DOSE REG.	DAY 1ST INJ.	NO. OF INJ.	DAY OF SAC.	DOSE	SURVIVORS	ANIMAL WT. DIFF.	TUMOR WT. OR SURVIVAL (T./C.)	PERCENT
B626322	Astilbe longicarpa Hay.	02	LE	08	Y	1	1	1	15	Z	400.0	5/6	- 3.2	8.2/ 8.2	100
	Saxifragaceae	50	WM	08	Y	1	1	3	04	07	400.0	6/6	- 6.0	4.0/ 7.3	54
	Pl, AQ/EtOH	90	KB	16	5						Slope	-1.00	ED50	2.2 x 10(1)	
	Mt. Ali, 01/67														
B672795	Astragalus sinicus L.	02	LE	06	2	1	1	1	09	30	400.0	5/6	- 3.9	9.0/ 8.5	105
	Leguminosae	02	PS	06	2	1	1	1	10	30	100.0	5/6	- 3.6	10.0/11.0	90
	Pl, AQ/EtOH	90	KB	06	9								ED50	M1.0 x 10(2)	
	Mt. Ta-hsue, 01/67														
B626313	Averrhoa carambola L.	02	LE	08	Y	1	1	1	15	Z	400.0	6/6	- 1.5	8.3/ 7.6	109
	Oxalidaceae	50	WM	08	Y	1	1	3	04	07	400.0	7/7	- 4.0	4.6/ 6.7	68
	Pl, AQ/EtOH	90	KB	16	5						Slope	-1.10	ED50	2.5 x 10(1)	
	Mt. Ali, 01/67														
B603859	Balansae tutcher Decne.	02	LE	05	2	1	1	1	15	Z	300.0	5/6	- 4.0	9.0/ 9.2	97
	Euphorbiaceae	50	WM	05	2	1	1	3	04	07	300.0	6/6	- 7.0	4.1/ 6.3	65
	Lf St, AQ/EtOH	90	KB	16	2								ED50	M1.0 x 10(2)	
	Hengchun, 1965														
B672865	Barringtonia racemosa	02	LE	02	2	1	1	1	09	30	100.0	6/6	- 1.8	10.0/ 9.7	103
	(L.) Bl.	02	PS	02	2	1	1	1	10	30	100.0	6/6	- 2.8	10.0/11.0	90
	Lecythidaceae	90	KB	16	5						Slope	-0.25	ED50	1.4 x 10(2)	
	Lf St, AQ/EtOH														
	Hengchun, 11/65														
B672044	Berberis brevisepala Hay.	02	LE	03	8	1	1	1	09	30	400.0	6/6	- 0.1	8.7/ 8.8	98
	Berberidaceae	02	PS	03	8	1	1	1	10	30	400.0	6/6	- 0.5	10.2/ 9.1	112
	Lf St, AQ/EtOH	90	KB	16	2						Slope	-0.0	ED50	M1.0 x 10(2)	
	Mt. Ta-hsue, 11/66														

Table 2 *In Vitro* And *In Vivo* Data On Taiwan Plant Extracts

NSC NO.	BOTANICAL NAME	HOST	TEST SYS.	SCREENER	VEHICLE	ROUTE	DOSE REG.	DAY 1ST INJ.	NO. OF INJ.	DAY OF SAC.	DOSE	SURVIVORS	ANIMAL WT. DIFF.	TUMOR WT. OR SURVIVAL (T./C.)	PERCENT
B672166	Berberis morrisonensis Hay.	06	LE	06	2	1	1	1	09	30	400.0	5/6	- 1.2	9.6/ 8.9	107
	Berberidaceae	02	PS	06	2	1	1	1	10	30	400.0	6/6	0.0	11.5/12.0	95
	Lf St, AQ/EtOH	90	KB	06	B						Slope	-0.48	ED50	Ml.0 x 10(2)	
	Mt. Ho-huan, 07/68														
B672113	Bladhia sieboldii Nakai	02	LE	08	2	1	1	1	09	30	38.0	6/6	- 0.9	9.2/ 8.8	104
	Myrsinaceae	02	PS	08	2	1	1	1	10	30	38.0	6/6	- 1.1	11.0/11.0	100
	Lf St, AQ/EtOH	90	KB	16	F						Slope	-1.04	ED50	2.4 x 10(1)	
	Mt. Kwan-in, 11/65														
B672874	Blechnum orientale L.	02	LE	02	2	1	1	1	09	30	75.0	6/6	- 0.9	8.8/ 9.6	91
	Polypodiaceae	02	PS	02	2	1	1	1	10	30	75.0	5/6	- 2.0	11.0/12.0	91
	Pl, AQ/EtOH	90	KB	16	5						Slope	-1.11	ED50	2.8 x 10(1)	
	Liu-kuei, 11/65														
B626228	Blumea balsamifera DC.	02	LE	03	8	1	1	1	15	Z	400.0	6/6	- 3.4	8.2/ 8.3	98
	Compositae	50	WM	03	8	1	1	3	04	07	400.0	7/7	- 5.0	6.6/10.5	62
	Lf St, AQ/EtOH	90	KB	16	5						Slope	-0.27	ED50	Ml.0 x 10(2)	
	Hengchun, 11/64														
B672763	Blumea myriocephala DC.	02	LE	05	2	1	1	1	09	30	200.0	6/6	- 1.6	9.3/ 9.7	95
	Compositae	02	PS	05	2	1	1	1	10	29	200.0	6/6	- 1.2	11.0/ 9.5	115
	Lf St, AQ/EtOH	90	KB	16	2						Slope	-0.89	ED50	2.0 x 10(1)	
	Chiayi, 11/66														
B672018	Boehmeria densiflora	02	LE	03	8	1	1	1	09	30	200.0	6/6	- 1.2	9.0/ 9.2	97
	Hook. & Arn.	02	PS	03	8	1	1	1	10	30	400.0	4/6	- 3.3	8.3/ 9.0	92
	Urticaceae	90	KB	16	5						Slope	-0.44	ED50	Ml.0 x 10(2)	
	Pl, AQ/EtOH														
	Chiayi, 01/67														

Table 2 *In Vitro* And *In Vivo* Data On Taiwan Plant Extracts

NSC NO.	BOTANICAL NAME	HOST	TEST SYS.	SCREENER	VEHICLE	ROUTE	DOSE REG.	DAY 1ST INJ.	NO. OF INJ.	DAY OF SAC.	DOSE	SURVIVORS	ANIMAL WT. DIFF.	TUMOR WT. OR SURVIVAL (T./C.)	PERCENT
B672068	Boehmeria frutescens Thunb.	02	LE	08	2	1	1	1	09	30	400.0	6/6	- 1.5	8.8/ 9.9	88
	Urticaceae	02	PS	08	2	1	1	1	10	30	200.0	6/6	- 2.7	11.0/11.0	100
	Pl, AQ/EtOH	90	KB	16	5						Slope	-0.91	ED50	3.2 x 10(1)	
	Chiayi, 11/66														
B672141	Boehmeria platyphylla	02	LE	08	2	1	1	1	09	30	400.0	6/6	- 1.6	9.0/ 8.8	102
	D. Don	02	PS	08	2	1	1	1	10	30	400.0	6/6	- 1.3	12.0/10.0	120
	Urticaceae	90	KB	16	2								ED50	M1.0 x 10(2)	
	Lf St, AQ/EtOH														
	Liu-kuei, 11/66														
B603860	Bougainvillaea sp.	02	LE	05	2	1	1	1	15	Z	400.0	6/6	- 0.6	9.2/ 9.2	100
	Nyctaginaceae	50	WM	05	2	1	1	3	04	07	400.0	6/6	- 6.0	7.7/ 6.3	122
	Lf St, AQ/EtOH	90	KB	16	5								ED50	M1.0 x 10(2)	
	Hengchun, 1965														
B672152	Bredia oldhamii Hook. f.	06	LE	06	2	1	1	1	09	30	400.0	6/6	- 1.0	8.3/ 8.9	93
	Melastomataceae	06	PS	06	2	1	1	1	10	30	200.0	6/6	- 1.0	9.0/ 9.0	100
	Lf St, AQ/EtOH	90	KB	06	B								ED50	M1.0 x 10(2)	
	Liu-kuei, 11/66														
B626300	Breynia formosana Hay.	02	LE	08	8	1	1	1	15	Z	400.0	6/6	- 2.7	8.3/ 7.6	109
	Euphorbiaceae	50	WM	08	Y	1	1	3	04	07	400.0	5/6	- 4.0	4.3/ 8.7	49
	Lf St, AQ/EtOH	90	KB	16	5						Slope	-0.44	ED50	4.1 x 10(1)	
	Hengchun, 11/65														
B626235	Breynia officinalis Hemsl.	02	LE	03	8	1	1	1	15	Z	400.0	6/6	- 2.6	8.3/ 8.7	95
	Euphorbiaceae	50	WM	03	8	1	1	3	04	07	200.0	7/7	- 4.0	7.3/12.7	57
	Lf St, AQ/EtOH	90	KB	16	5								ED50	M1.0 x 10(2)	
	Hengchun, 11/64														

Table 2 *In Vitro* And *In Vivo* Data On Taiwan Plant Extracts

NSC NO.	BOTANICAL NAME	HOST	TEST SYS.	SCREEN	VEHICLE	ROUTE	DOSE REG.	DAY 1ST INJ.	NO. OF INJ.	DAY OF SAC.	DOSE	SURVIVORS	ANIMAL WT. DIFF.	TUMOR WT. OR SURVIVAL (T./C.)	PERCENT
B672063	Bridelia balansae Tutch.	02	LE	03	8	1	1	1	09	30	100.0	6/6	- 1.0	9.3/ 9.4	98
	Euphorbiaceae	02	PS	03	8	1	1	1	10	30	100.0	6/6	- 3.4	9.5/ 9.9	95
	Lf St, AQ/EtOH	90	KB	16	F						Slope	-1.01	ED50	2.3 x 10(1)	
	Liu-kuei, 11/66														
B626252	Broussonetia papyrifera	02	LE	03	8	1	1	1	15	Z	400.0	5/6	- 1.6	8.6/ 8.7	98
	Vent.	50	WM	03	8	1	1	3	04	07	400.0	7/7	- 4.1	4.3/ 4.1	104
	Moraceae	90	KB	16	5						Slope	-0.84	ED50	2.2 x 10(1)	
	Lf St, AQ/EtOH														
	Hengchun, 11/64														
B603862	Buchanania arborescens Bl.	02	LE	05	2	1	1	1	15	Z	400.0	6/6	- 1.0	8.2/ 9.2	89
	Anacardiaceae	50	WM	05	2	1	1	3	04	07	400.0	6/6	- 7.0	4.7/ 6.3	74
	Lf St, AQ/EtOH	90	KB	16	5						Slope	-0.96	ED50	3.5 x 10(1)	
	Hengchun, 1965														
B672872	Buddleja asiatica Lour.	02	LE	02	2	1	1	1	09	30	100.0	6/6	- 2.0	9.7/ 9.9	97
	Loganiaceae	02	PS	02	2	1	1	1	10	30	100.0	6/6	- 3.9	10.0/11.0	90
	Lf St, AQ/EtOH	90	KB	16	5						Slope	-0.72	ED50	4.6 x 10(1)	
	Hengchun, 11/65														
B672951	Buxus japonica Muell.	02	PS	03	M	1	1	1	09	30	100.0	6/6	- 1.6	11.0/10.0	110
	Buxaceae	90	KB	16	5								ED50	M1.0 x 10(2)	
	Lf St, AQ/EtOH														
	Hengchun, 01/71														
B626225	Caesalpinia nuga Ait.	02	LE	03	2	1	1	1	15	Z	400.0	6/6	- 1.8	8.5/ 8.3	102
	Leguminosae	50	WM	03	2	1	1	3	04	07	400.0	7/7	2.0	7.6/10.5	72
	Lf St, AQ/EtOH	90	KB	16	2								ED50	M1.0 x 10(2)	
	Hengchun, 11/64														

Table 2 *In Vitro* And *In Vivo* Data On Taiwan Plant Extracts

NSC NO.	BOTANICAL NAME	HOST	TEST SYS.	SCREENER	VEHICLE	ROUTE	DOSE REG.	DAY 1ST INJ.	NO. OF INJ.	DAY OF SAC.	DOSE	SURVIVORS	ANIMAL WT. DIFF.	TUMOR WT. OR SURVIVAL (T./C.)	PERCENT
B603863	Caesalpinia pulcherrima Sw.	02	LE	05	2	1	1	1	15	Z	400.0	6/6	- 0.4	9.5/ 9.2	103
	Leguminosae	50	WM	05	2	1	1	3	04	07	400.0	6/6	- 6.0	4.8/ 6.1	78
	Lf St, AQ/EtOH	90	KB	16	5						Slope	-0.99	ED50	3.2 x 10(1)	
	Hengchun, 1965														
B626315	Calamus formosanus Becc.	02	LE	08	8	1	1	1	15	Z	400.0	6/6	- 2.8	8.7/ 7.6	114
	Palmae	50	WM	08	8	1	1	3	04	07	400.0	5/6	4.0	6.7/ 8.6	77
	Lf St, AQ/EtOH	90	KB	16	5						Slope	-0.94	ED50	2.0 x 10(1)	
	Hengchun, 11/65														
B603865	Calamus margaritae Hance	02	LE	05	2	1	1	1	15	Z	400.0	5/6	- 1.5	9.2/ 9.2	100
	Palmae	50	WM	05	2	1	1	3	04	07	400.0	6/6	-12.0	3.1/ 6.3	49
	Lf St, AQ/EtOH	90	KB	16	5								ED50	M1.0 x 10(2)	
	Hengchun, 1965														
B626312	Calanthe longicalcarata Hay.	02	LE	08	8	1	1	1	15	Z	400.0	4/6	- 3.5	8.3/ 7.6	109
	Orchidaceae	50	WM	08	8	1	1	3	04	07	400.0	7/7	- 3.0	3.9/ 6.7	58
	Pl, AQ/EtOH	90	KB	16	5						Slope	-0.97	ED50	2.1 x 10(1)	
	Mt. Ali, 01/67														
B626251	Calliandra surinamensis	02	LE	03	8	1	1	1	15	Z	400.0	6/6	- 1.7	9.5/ 8.7	109
	Benth.	50	WM	03	8	1	1	3	04	07	400.0	7/7	- 7.0	3.2/ 4.1	78
	Leguminosae	90	KB	16	5						Slope	-0.39	ED50	M1.0 x 10(2)	
	Lf St, AQ/EtOH														
	Hengchun, 11/64														
B626327	Callicarpa formosana Rolfe	02	LE	08	8	1	1	1	15	Z	400.0	6/6	- 1.0	8.7/ 8.2	106
	Verbenaceae	50	WM	08	8	1	1	3	04	07	400.0	4/6	4.0	7.9/ 8.6	91
	Pl, AQ/EtOH	90	KB	16	5						Slope	-0.53	ED50	5.0 x 10(1)	
	Hengchun, 11/65														

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NSC NO.	BOTANICAL NAME	HOST	TEST SYS.	SCREENER	VEHICLE	ROUTE	DOSE REG.	DAY 1ST INJ.	NO. OF INJ.	DAY OF SAC.	DOSE	SURVIVORS	ANIMAL WT. DIFF.	TUMOR WT. OR SURVIVAL (T./C.)	PERCENT
B672145	Camellia tenuiflora	02	LE	06	2	1	1	1	09	30	150.0	6/6	- 4.5	9.0/ 9.4	95
	(Hay.) Makino	02	PS	06	2	1	1	1	10	30	75.0	6/6	- 2.6	10.0/10.0	100
	Theaceae	90	KB	06	B						Slope	-0.51	ED50	1.2 x 10(2)	
	Lf St, AQ/EtOH														
	Liu-kuei, 11/66														
B603866	Capparis kanehirai Hay.	02	LE	05	2	1	1	1	15	Z	400.0	6/6	- 1.0	9.3/ 9.2	101
	Capparidaceae	50	WM	05	2	1	1	3	04	07	400.0	6/6	- 2.0	5.7/ 6.3	90
	Lf St, AQ/EtOH	90	KB	16	5								ED50	M1.0 x 10(2)	
	Hengchun, 1965														
B672147	Cardamine parviflora L.	02	LE	06	2	1	1	1	09	30	75.0	6/6	- 0.3	8.7/ 9.4	92
	Cruciferae	02	PS	06	2	1	1	1	10	30	75.0	6/6	- 2.3	12.0/11.0	109
	Pl, AQ/EtOH	90	KB	06	B								ED50	M1.0 x 10(2)	
	Mt. Ta-hsue, 11/66														
B672766	Carex baccans Nees	02	LE	05	2	1	1	1	09	30	400.0	6/6	- 2.0	10.0/ 9.8	102
	Cyperaceae	02	PS	05	2	1	1	1	10	29	400.0	6/6	- 2.0	9.0/ 9.5	94
	Pl, AQ/EtOH	90	KB	16	5						Slope	-0.37	ED50	M1.0 x 10(2)	
	Chiayi, 11/66														
B603867	Carludovica palmata Ruiz.	02	LE	05	2	1	1	1	15	Z	400.0	6/6	- 1.6	9.3/ 9.2	101
	Cyclanthaceae	50	WM	05	2	1	1	3	04	07	400.0	6/6	- 3.0	5.0/ 6.3	79
	Lf St, AQ/EtOH	90	KB	16	5								ED50	M1.0 x 10(2)	
	Hengchun, 1965														
B626292	Carpinus kawakamii Hay.	02	LE	08	8	1	1	1	15	Z	200.0	6/6	- 2.0	8.3/ 8.4	98
	Betulaceae	50	WM	08	8	1	1	3	04	07	200.0	5/6	-11.0	5.8/ 8.0	72
	Pl, AQ/EtOH	90	KB	16	5						Slope	-1.1	ED50	3.4 x 10(1)	
	Mt. Ali, 01/67														

Table 2 *In Vitro* And *In Vivo* Data On Taiwan Plant Extracts

NSC NO.	BOTANICAL NAME	HOST	TEST SYS.	SCREENER	VEHICLE	ROUTE	DOSE REG.	DAY 1ST INJ.	NO. OF INJ.	DAY OF SAC.	DOSE	SURVIVORS	ANIMAL WT. DIFF.	TUMOR WT. OR SURVIVAL (T./C.)	PERCENT
B603864	Cassia siamea Lam.	02	LE	05	2	1	1	1	15	Z	400.0	6/6	- 1.3	9.5/ 9.2	103
	Leguminosae	50	WM	05	2	1	1	3	04	07	400.0	6/6	- 5.0	4.9/ 6.3	77
	Lf St, AQ/EtOH	90	KB	16	5								ED50	M1.0 x 10(2)	
	Hengchun, 1965														
B672075	Castanea crenata	02	LE	08	2	1	1	1	09	30	200.0	6/6	- 2.5	9.5/ 9.7	97
	Sieb. & Zucc.	02	PS	08	2	1	1	1	10	30	400.0	5/6	- 4.1	10.0/11.0	90
	Fagaceae	90	KB	16	5						Slope	-0.81	ED50	4.1 x 10(1)	
	Lf St, AQ/EtOH														
	Liu-kuei, 11/66														
B672831	Castanopsis tribuloides DC.	02	LE	02	2	1	1	1	09	30	400.0	6/6	- 2.2	9.2/ 8.7	105
	var. formosana Skan.	02	PS	02	2	1	1	1	10	30	50.0	6/6	- 1.8	10.0/11.0	90
	Fagaceae	90	KB	16	5								ED50	M1.0 x 10(2)	
	Lf St, AQ/EtOH														
	Liu-kuei, 11/66														
B603869	Celtis formosana Hay.	02	LE	05	2	1	1	1	15	Z	400.0	6/6	- 1.5	9.3/ 8.9	104
	Ulmaceae	50	WM	05	2	1	1	3	04	07	400.0	6/6	- 7.0	6.0/ 6.3	95
	Lf St, AQ/EtOH	90	KB	16	5								ED50	M1.0 x 10(2)	
	Hengchun, 1965														
B672790	Cephalotaxus wilsoniana	02	LE	06	2	1	1	1	09	30	150.0	4/6	- 1.0	9.0/ 9.5	94
	Hay.	02	PS	06	2	1	1	1	10	30	150.0	6/6	- 2.8	11.5/12.0	95
	Cephalotaxaceae	90	KB	06	9						Slope	-0.72	ED50	5.0 x 10(1)	
	Lf St, AQ/EtOH														
	Mt. Ch'i-hsing, 11/66														
B626468	Chamabaina cuspidata	02	LE	03	8	1	1	1	09	30	400.0	6/6	- 1.4	9.0/ 8.0	112
	Wight	50	WA	03	8	1	1	3	04	07	400.0	6/7	- 6.0	6.9/ 9.5	72
	Urticaceae	90	KB	16	5						Slope	-0.43	ED50	1.2 x 10(2)	
	Lf St, AQ/EtOH														
	Mt. Ta-hsue, 01/67														

Table 2 *In Vitro* And *In Vivo* Data On Taiwan Plant Extracts

NSC NO.	BOTANICAL NAME	HOST	TEST SYS.	SCREENER	VEHICLE	ROUTE	DOSE REG.	DAY 1ST INJ.	NO. OF INJ.	DAY OF SAC.	DOSE	SURVIVORS	ANIMAL WT. DIFF.	TUMOR WT. OR SURVIVAL (T./C.)	PERCENT
B672825	Chamaecyparis formosensis	02	LE	02	2	1	1	1	09	30	100.0	6/6	- 0.4	9.2/ 8.7	105
	Matsum.	02	PS	02	2	1	1	1	10	30	200.0	6/6	- 3.8	11.0/11.0	100
	Cupressaceae	90	KB	16	5						Slope	-1.17	ED50	2.8 x 10(1)	
	Lf St, AQ/EtOH														
	Mt. Ch'i-hsing, 11/66														
B672173	Chamaecyparis obtusa	06	LE	06	2	1	1	1	09	30	400.0	6/6	- 4.4	8.7/ 8.9	97
	Sieb. & Zucc.	02	PS	06	2	1	1	1	10	30	400.0	6/6	- 0.6	10.5/12.0	87
	Cupressaceae	90	KB	06	B								ED50	M1.0 x 10(2)	
	Lf St, AQ/EtOH														
	Liu-kuei, 07/68														
B672860	Chloranthus oldhami Solms.	02	LE	02	2	1	1	1	09	30	400.0	6/6	- 2.1	9.5/ 9.1	104
	Chloranthaceae	02	PS	02	2	1	1	1	10	30	400.0	6/6	- 2.0	8.5/ 9.0	94
	Lf St, AQ/EtOH	90	KB	16	2								ED50	M1.0 x 10(2)	
	Mt. Ch'i-hsing, 11/66														
B626273	Chrysophyllum cainito L.	02	LE	03	8	1	1	1	15	Z	400.0	6/6	- 0.9	8.5/ 8.7	97
	Sapotaceae	50	WM	03	8	1	1	3	04	07	400.0	7/7	- 8.0	2.8/ 3.8	73
	Lf St, AQ/EtOH	90	KB	16	5						Slope	-0.37	ED50	M1.0 x 10(2)	
	Hengchun, 11/64														
B672053	Cinchona ledgeriana Moens.	02	LE	03	8	1	1	1	09	30	200.0	6/6	0	8.8/ 8.8	100
	Rubiaceae	02	PS	03	8	1	1	1	10	30	200.0	6/6	- 1.6	8.7/10.1	86
	Lf St, AQ/EtOH	90	KB	16	F						Slope	-0.42	ED50	M1.0 x 10(2)	
	Liu-kuei, 11/66														
B672846	Cinchona pubescens Vahl	02	LE	02	2	1	1	1	09	30	400.0	6/6	- 2.5	9.3/ 8.3	112
	Rubiaceae	02	PS	02	2	1	1	1	10	30	100.0	6/6	- 1.9	10.0/ 8.5	117
	Lf St, AQ/EtOH	90	KB	16	5								ED50	M1.0 x 10(2)	
	Mt. Ch'i-hsing, 11/66														

Table 2 *In Vitro* And *In Vivo* Data On Taiwan Plant Extracts

NSC NO.	BOTANICAL NAME	HOST	TEST SYS.	SCREENER	VEHICLE	ROUTE	DOSE REG.	DAY 1ST INJ.	NO. OF INJ.	DAY OF SAC.	DOSE	SURVIVORS	ANIMAL WT. DIFF.	TUMOR WT. OR SURVIVAL (T./C.)	PERCENT
B603870	Cinnamomum camphora	02	LE	05	2	1	1	1	15	Z	300.0	6/6	- 0.5	9.5/ 8.9	106
	var. nominale Hay.	50	WM	05	2	1	1	3	04	07	300.0	6/6	- 6.0	5.1/ 6.3	80
	Lauraceae	90	KB	16	5						Slope	-0.86	ED50	3.3 x 10(1)	
	Lf St, AQ/EtOH														
	Hengchun, 1965														
B672143	Cinnamomum osmophloeum	06	LE	06	2	1	1	1	09	30	400.0	6/6	- 1.2	8.8/ 8.9	98
	Kaneh.	06	PS	06	2	1	1	1	10	30	100.0	6/6	- 1.2	9.0/ 9.0	100
	Lauraceae	90	KB	06	B								ED50	M1.0 x 10(2)	
	Lf St, AQ/EtOH														
	Liu-kuei, 11/66														
B603871	Cinnamomum reticulatum Hay.	02	LE	05	2	1	1	1	15	Z	300.0	6/6	- 2.1	9.2/ 9.5	96
	Lauraceae	50	WM	05	2	1	1	3	04	07	300.0	6/6	- 8.0	5.6/ 6.3	88
	Lf St, AQ/EtOH	90	KB	16	5								ED50	M1.0 x 10(2)	
	Hengchun, 1965														
B672084	Cinnamomum sp.	02	LE	08	2	1	1	1	09	30	400.0	6/6	- 1.5	9.5/ 9.9	95
	Lauraceae	02	PS	08	2	1	1	1	10	30	400.0	6/6	- 2.9	11.5/11.0	104
	Lf St, AQ/EtOH	90	KB	16	5						Slope	-0.82	ED50	7.4 x 10(1)	
	Hengchun, 11/65														
B672085	Citrus limonia Osbeck	02	LE	08	2	1	1	1	09	30	400.0	6/6	0.4	10.5/ 9.9	106
	Rutaceae	02	PS	08	2	1	1	1	10	30	400.0	6/6	- 0.6	12.0/11.0	109
	Lf St, AQ/EtOH	90	KB	16	5						Slope	-0.44	ED50	4.0 x 10(1)	
	Hengchun, 11/65														
B603872	Citrus sp.	02	LE	05	2	1	1	1	15	Z	400.0	6/6	- 1.8	9.7/ 9.5	102
	Rutaceae	50	WM	05	2	1	1	3	04	07	400.0	6/6	- 6.0	4.8/ 6.3	76
	Lf St, AQ/EtOH	90	KB	16	5								ED50	M1.0 x 10(2)	
	Hengchun, 1965														

Table 2 *In Vitro* And *In Vivo* Data On Taiwan Plant Extracts

NSC NO.	BOTANICAL NAME	HOST	TEST SYS.	SCREENER	VEHICLE	ROUTE	DOSE REG.	DAY 1ST INJ.	NO. OF INJ.	DAY OF SAC.	DOSE	SURVIVORS	ANIMAL WT. DIFF.	TUMOR WT. OR SURVIVAL (T./C.)	PERCENT
B672159	Clausena lansium Skeels	02	LE	06	2	1	1	1	09	30	100.0	6/6	- 3.1	8.7/ 8.3	104
	Rutaceae	06	PS	06	2	1	1	1	10	30	100.0	6/6	- 2.4	9.0/ 9.0	100
	Lf St, AQ/EtOH	90	KB	06	B						Slope	-0.84	ED50	4.8 x 10(1)	
	Mt. Ali, 01/67														
B672088	Clematis formosana O. K.	02	LE	08	2	1	1	1	09	30	200.0	6/6	- 3.2	9.3/ 8.6	108
	Ranunculaceae	02	PS	08	2	1	1	1	10	30	200.0	6/6	- 3.0	10.0/11.0	90
	Pl, AQ/EtOH	90	KB	16	5								ED50	M1.0 x 10(2)	
	Chiayi, 11/65														
B603873	Clematis gouriana Roxb.	02	LE	05	2	1	1	1	15	Z	400.0	5/6	- 0.2	9.0/ 9.5	94
	Ranunculaceae	50	WM	05	2	1	1	3	04	07	400.0	6/6	- 1.0	6.1/ 6.3	96
	Lf St, AQ/EtOH	90	KB	16	5								ED50	M1.0 x 10(2)	
	Hengchun, 1965														
B672197	Clematis morii Hay.	02	LE	06	2	1	1	1	09	30	400.0	6/6	- 0.4	9.2/ 9.4	97
	Ranunculaceae	02	PS	06	2	1	1	1	10	30	400.0	6/6	- 0.5	11.0/11.0	100
	Px, AQ/EtOH	90	KB	06	B								ED50	M1.0 x 10(2)	
	Mt. Ho-huan, 07/66														
B672806	Clematis pierotis Miq.	02	LE	06	2	1	1	1	09	30	37.5	6/6	- 1.6	9.0/ 8.9	101
	Ranunculaceae	02	PS	06	2	1	1	1	10	30	37.5	>/6	- 3.1	11.0/11.0	100
	Pl, AQ/EtOH	90	KB	06	9								ED50	M1.0 x 10(2)	
	Liu-kuei, 11/66														
B672875	Clematis sp.	02	LE	02	2	1	1	1	09	30	75.0	6/6	- 2.4	10.0/ 9.6	104
	Ranunculaceae	02	PS	02	2	1	1	1	10	30	75.0	6/6	- 4.4	14.5/12.0	120
	Lf St, AQ/EtOH	90	KB	16	5						Slope	-0.83	ED50	1.8 x 10(1)	
	Hengchun, 11/65														

Table 2 *In Vitro* And *In Vivo* Data On Taiwan Plant Extracts

NSC NO.	BOTANICAL NAME	HOST	TEST SYS.	SCREENER	VEHICLE	ROUTE	DOSE REG.	DAY 1ST INJ.	NO. OF INJ.	DAY OF SAC.	DOSE	SURVIVORS	ANIMAL WT. DIFF.	TUMOR WT. OR SURVIVAL (T./C.)	PERCENT
B672838	Clerodendron paniculatum L.	02	LE	02	2	1	1	1	09	30	400.0	5/6	- 0.4	8.6/ 8.4	102
	Verbenaceae	02	PS	02	2	1	1	1	10	30	400.0	6/6	- 1.6	14.5/12.0	120
	Lf St, AQ/EtOH	90	KB	16	2								ED50	Ml.0 x 10(2)	
	Hengchun, 11/65														
B603874	Clerodendron trichotomum	02	LE	05	2	1	1	1	15	Z	400.0	6/6	0.2	9.4/ 9.5	98
	Thunb.	50	WM	05	2	1	1	3	04	07	400.0	6/6	- 6.0	7.0/ 6.3	111
	Verbenaceae	90	KB	16	5								ED50	Ml.0 x 10(2)	
	Lf St, AQ/EtOH														
	Hengchun, 1965														
B626318	Coccoloba uvifera L.	02	LE	08	Y	1	1	1	15	Z	100.0	6/6	- 1.6	8.5/ 8.4	101
	Polygonaceae	50	WM	08	8	1	1	3	04	07	100.0	5/6	- 5.0	5.7/ 8.0	71
	Pl, AQ/EtOH	90	KB	16	5						Slope	-0.90	ED50	4.1 x 10(1)	
	Mt. Ali, 01/67														
B672012	Colysis elliptica	02	LE	03	2	1	1	1	09	30	400.0	6/6	0.4	8.8/ 8.6	102
	(Thunb.) Ching.	02	PS	03	2	1	1	1	10	30	400.0	6/6	- 0.8	10.7/ 9.0	118
	Polypodiaceae	90	KB	16	5						Slope	0.0	ED50	Ml.0 x 10(2)	
	Pl, AQ/EtOH														
	Chiayi, 01/67														
B672029	Colysis hemionitidea	02	LE	03	2	1	1	1	09	30	100.0	6/6	- 1.2	8.7/ 8.5	102
	(Wall.) Presl	02	PS	03	2	1	1	1	10	30	100.0	6/6	- 1.9	9.2/ 9.6	95
	Polypodiaceae	90	KB	16	2								ED50	Ml.0 x 10(2)	
	Pl, AQ/EtOH														
	Mt. Ali, 11/66														
B626469	Commelina obliqua Ham.	02	LE	03	8	1	1	1	09	30	400.0	6/6	- 0.7	8.0/ 8.0	100
	Commelinaceae	50	WA	03	8	1	1	3	04	07	400.0	6/7	- 5.0	4.3/ 9.5	45
	Pl, AQ/EtOH	90	KB	16	5								ED50	Ml.0 x 10(2)	
	Liu-kuei, 01/67														

Table 2 *In Vitro* And *In Vivo* Data On Taiwan Plant Extracts

NSC NO.	BOTANICAL NAME	HOST	TEST SYS.	SCREENER	VEHICLE	ROUTE	DOSE REG.	DAY 1ST INJ.	NO. OF INJ.	DAY OF SAC.	DOSE	SURVIVORS	ANIMAL WT. DIFF.	TUMOR WT. OR SURVIVAL (T./C.)	PERCENT
B626306	Coniogramme intermedia	02	LE	08	8	1	1	1	15	Z	400.0	6/6	- 1.7	7.7/ 7.6	101
	Hieron.	50	WM	08	8	1	1	3	04	07	400.0	4/6	1.0	5.8/ 8.7	66
	Polypodiaceae	90	KB	16	5								ED50	Ml.0 x 10(2)	
	Pl, AQ/EtOH														
	Mt. Ali, 01/67														
B672867	Copaifera officinalis L.	02	LE	02	2	1	1	1	09	30	200.0	4/6	- 1.5	10.5/ 9.7	108
	Leguminosae	02	PS	02	2	1	1	1	10	30	400.0	6/6	- 4.3	11.5/12.0	95
	Lf St, AQ/EtOH	90	KB	16	5						Slope	-1.09	ED50	2.5 x 10(1)	
	Hengchun, 11/65														
B603875	Cordia myxa L.	02	LE	05	2	1	1	1	15	Z	400.0	5/6	- 2.1	9.4/ 9.5	98
	Borraginaceae	50	WM	05	2	1	1	3	04	07	400.0	6/6	- 5.0	4.3/ 6.3	68
	Lf St, AQ/EtOH	90	KB	16	5						Slope	-0.42	ED50	Ml.0 x 10(2)	
	Hengchun, 1965														
B672172	Coriaria summicola Hay.	06	LE	06	2	1	1	1	09	30	400.0	6/6	- 1.2	8.7/ 8.9	97
	Coriariaceae	02	PS	06	2	1	1	1	10	30	400.0	6/6	0.8	12.0/12.0	100
	Lf St, AQ/EtOH	90	KB	06	B								ED50	Ml.0 x 10(2)	
	Mt. Ho-huan, 07/68														
B672189	Corydalis campulicarpa Hay.	02	LE	06	2	1	1	1	09	30	200.0	6/6	- 1.4	8.7/ 9.1	95
	Papaveraceae	02	PS	06	2	1	1	1	10	30	400.0	6/6	- 2.9	11.0/11.0	100
	Pl, AQ/EtOH	90	KB	06	B						Slope	-0.54	ED50	8.1 x 10(1)	
	Mt. Ho-huan, 07/66														
B672803	Corydalis tashiroi Makino	06	LE	06	2	1	1	1	09	30	100.0	5/6	- 2.8	8.0/ 8.1	98
	Papaveraceae	02	PS	06	2	1	1	1	10	30	200.0	5/6	- 2.3	11.0/11.0	100
	Pl, AQ/EtOH	90	KB	06	9								ED50	Ml.0 x 10(2)	
	Mt. Ta-hsue, 01/67														

Table 2 *In Vitro* And *In Vivo* Data On Taiwan Plant Extracts

NSC NO.	BOTANICAL NAME	HOST	TEST SYS.	SCREENER	VEHICLE	ROUTE	DOSE REG.	DAY 1ST INJ.	NO. OF INJ.	DAY OF SAC.	DOSE	SURVIVORS	ANIMAL WT. DIFF.	TUMOR WT. OR SURVIVAL (T./C.)	PERCENT
B603868	Corypha umberaculifera L.	02	LE	05	2	1	1	1	15	Z	300.0	6/6	- 2.6	10.0/99.2	108
	Palmae	50	WM	05	2	1	1	3	04	07	300.0	6/6	- 5.0	5.4/ 6.5	85
	Lf, AQ/EtOH	90	KB	16	5								ED50	M1.0 x 10(2)	
	Hengchun, 1965														
B626223	Crescentia cujete L.	02	LE	03	2	1	1	1	15	Z	400.0	5/6	- 0.7	8.0/ 8.3	96
	Bignoniaceae	50	WM	03	2	1	1	3	04	07	400.0	6/6	2.0	9.4/14.5	64
	Lf St, AQ/EtOH	90	KB	16	5								ED50	M1.0 x 10(2)	
	Hengchun, 11/64														
B672151	Crotalaria saltiana Andr.	06	LE	06	2	1	1	1	09	30	400.0	5/6	- 1.1	9.0/ 8.9	101
	Leguminosae	06	PS	06	2	1	1	1	10	30	200.0	6/6	- 1.1	9.0/ 9.0	100
	Pl, AQ/EtOH	90	KB	06	B								ED50	M1.0 x 10(2)	
	Mt. Ta-hsue, 11/66														
B603877	Cryptostegia sp.	02	LE	05	2	1	1	1	15	Z	400.0	5/6	- 2.6	10.4/ 9.5	109
	Asclepiadaceae	50	WM	05	2	1	1	3	04	07	400.0	6/6	-14.0	3.9/ 6.3	61
	Lf St, AQ/EtOH	90	KB	16	5						Slope	-0.86	ED50	1.8 x 10(1)	
	Hengchun, 1965														
B603376	Cudrania cochinchinensis	02	LE	05	2	1	1	1	15	Z	400.0	6/6	- 0.1	9.8/ 9.5	103
	Kudo & Masam.	50	WM	05	2	1	1	3	04	07	400.0	6/6	- 4.0	7.0/ 6.3	111
	Moraceae	90	KB	16	5						Slope	-0.33	ED50	M1.0 x 10(2)	
	Lf St, AQ/EtOH														
	Hengchun, 1965														
B672851	Cunninghamia konishii Hay.	02	LE	02	C	1	1	1	09	30	300.0	5/6	- 2.4	9.8/ 8.7	112
	Taxodiaceae	02	PS	02	2	1	1	1	10	30	150.0	6/6	- 1.3	10.5/11.0	95
	Lf St, AQ/EtOH	90	KB	16	5						Slope	-1.36	ED50	3.4 x 10(1)	
	Mt. Ch'i-hsing, 11/66														

Table 2 *In Vitro* And *In Vivo* Data On Taiwan Plant Extracts

NSC NO.	BOTANICAL NAME	HOST	TEST SYS.	SCREENER	VEHICLE	ROUTE	DOSE REG.	DAY 1ST INJ.	NO. OF INJ.	DAY OF SAC.	DOSE	SURVIVORS	ANIMAL WT. DIFF.	TUMOR WT. OR SURVIVAL (T./C.)	PERCENT
B626276	Curcuma aromatica Salisb.	02	LE	03	2	1	1	1	15	Z	400.0	6/6	- 1.3	8.0/ 8.0	100
	Zingiberaceae	50	WM	03	2	1	1	3	04	07	400.0	7/7	- 3.0	5.2/10.9	47
	Lf St Fl, AQ/EtOH	90	KB	16	5								ED50	M1.0 x 10(2)	
	Hengchun, 11/64														
B672855	Cyathula prostrata Bl.	02	LE	02	2	1	1	1	09	30	200.0	6/6	- 1.0	9.5/ 9.7	97
	Amaranthaceae	02	PS	02	2	1	1	1	10	30	100.0	6/6	- 0.6	11.5/11.0	104
	Lf St, AQ/EtOH	90	KB	16	2								ED50	M1.0 x 10(2)	
	Liu-kuei, 11/66														
B603757	Cycas revoluta Thunb.	02	LE	05	2	1	1	1	Z	Z	500.0	6/6	0.2	8.7/ 9.1	95
	Cycadaceae	50	WM	05	2	1	1	3	04	07	500.0	6/6	- 4.0	7.9/ 9.7	81
	Pl, EtOH	90	KB	06	B								ED50	M1.0 x 10(2)	
	Taipei, 1965														
B672832	Cyclobalanopsis gilva	02	LE	02	2	1	1	1	09	30	300.0	4/6	- 5.3	8.0/ 9.3	86
	(Bl.) Oerst.	02	PS	02	2	1	1	1	10	30	75.0	6/6	- 1.1	10.5/10.0	105
	Fagaceae	90	KB	16	5						Slope	-1.21	ED50	3.0 x 10(1)	
	Lf St, AQ/EtOH														
	Mt. Ch'i-hsing, 11/66														
B672089	Cyclobalanopsis morii	02	LE	08	2	1	1	1	09	30	200.0	6/6	- 2.2	8.8/ 9.7	90
	(Hay.) Schott.	02	PS	08	2	1	1	1	10	30	400.0	6/6	- 2.7	11.5/11.0	104
	Fagaceae	90	KB	16	5						Slope	-0.62	ED50	7.1 x 10(1)	
	Lf St, AQ/EtOH														
	Mt. Ta-hsue, 11/65														
B626265	Cyclophorus adnascens	02	LE	03	2	1	1	1	15	Z	400.0	6/6	- 2.3	9.0/ 8.7	103
	(Sw.) Desv.	50	WM	03	2	1	1	3	04	07	400.0	6/6	- 9.0	4.5/ 5.4	83
	Polypodiaceae	90	KB	16	5						Slope	-0.33	ED50	3.4 x 10(1)	
	Pl, AQ/EtOH														
	Hengchun, 11/64														

Table 2 *In Vitro* And *In Vivo* Data On Taiwan Plant Extracts

NSC NO.	BOTANICAL NAME	HOST	TEST SYS.	SCREENER	VEHICLE	ROUTE	DOSE REG.	DAY 1ST INJ.	NO. OF INJ.	DAY OF SAC.	DOSE	SURVIVORS	ANIMAL WT. DIFF.	TUMOR WT. OR SURVIVAL (T./C.)	PERCENT
B603878	Cymbopogon citratus Stapf	02	LE	05	2	1	1	1	15	Z	400.0	6/6	- 2.4	9.7/ 9.5	102
	Gramineae	50	WM	05	2	1	1	3	04	07	400.0	6/6	- 5.0	4.3/ 6.3	68
	Lf St, AQ/EtOH	90	KB	16	5								ED50	M1.0 x 10(2)	
	Hengchun, 1965														
B672900	Cyperus distans L. f.	02	LE	02	2	1	1	1	09	30	400.0	5/6	- 0.5	9.4/ 9.4	100
	Cyperaceae	02	PS	02	2	1	1	1	10	30	400.0	6/6	- 2.8	9.5/10.5	90
	Pl, AQ/EtOH	90	KB	16	5								ED50	M1.0 x 10(2)	
	Mt. Ch'i-hsing, 11/66														
B626229	Cyperus rotundus L.	02	LE	03	2	1	1	1	15	Z	400.0	6/6	- 1.8	8.5/ 8.3	102
	Cyperaceae	50	WM	03	2	1	1	3	04	07	400.0	7/7	- 1.0	9.2/10.5	87
	Lf St, AQ/EtOH	90	KB	16	5								ED50	M1.0 x 10(2)	
	Hengchun, 11/64														
B603879	Cyperus sp.	02	LE	05	2	1	1	1	15	Z	400.0	6/6	- 1.3	9.6/ 9.5	101
	Cyperaceae	50	WM	05	2	1	1	3	04	07	400.0	6/6	- 2.0	5.1/ 6.3	80
	Lf St, AQ/EtOH	90	KB	16	2								ED50	M1.0 x 10(2)	
	Hengchun, 1965														
B672903	Cyrtococcum patens	02	LE	02	2	1	1	1	09	30	400.0	5/6	- 1.0	8.4/ 9.3	90
	(L.) A. Camus	06	PS	02	2	1	1	1	09	30	100.0	6/6	0.1	11.0/11.0	100
	Gramineae	90	KB	16	2								ED50	M1.0 x 10(2)	
	Pl, AQ/EtOH														
	Mt. Ch'i-hsing, 11/65														
B672826	Daphniphyllum pentandrum	02	LE	02	2	1	1	1	09	30	400.0	6/6	0.5	8.5/ 8.4	101
	Hay.	02	PS	02	2	1	1	1	10	30	400.0	6/6	- 0.6	12.0/10.5	114
	var. oldhamii	90	KB	16	2								ED50	M1.0 x 10(2)	
	(Hemsl.) Hurusawa														
	Euphorbiaceae														
	Lf St, AQ/EtOH														
	Mt. Ch'i-hsing, 11/66														

Table 2 *In Vitro* And *In Vivo* Data On Taiwan Plant Extracts

NSC NO.	BOTANICAL NAME	HOST	TEST SYS.	SCREENER	VEHICLE	ROUTE	DOSE REG.	DAY 1ST INJ.	NO. OF INJ.	DAY OF SAC.	DOSE	SURVIVORS	ANIMAL WT. DIFF.	TUMOR WT. OR SURVIVAL (T./C.)	PERCENT
B672004	Debregeasia edulis Wedd.	02	LE	03	8	1	1	1	09	30	200.0	6/6	- 0.7	8.7/ 8.9	97
	Urticaceae	02	PS	03	8	1	1	1	10	30	200.0	6/6	- 2.8	10.2/ 9.6	106
	Pl, AQ/EtOH	90	KB	16	5						Slope	-0.50	ED50	1.0 x 10(2)	
	Mt. Ta-hsue, 01/67														
B603880	Decaspermum fruticosum	02	LE	05	2	1	1	1	15	Z	400.0	6/6	- 2.4	8.7/ 9.0	96
	Forst.	50	WM	05	2	1	1	3	04	07	400.0	6/6	- 8.0	4.1/ 6.3	65
	Myrtaceae	90	KB	16	E						Slope	-1.10	ED50	2.9 x 10(1)	
	Lf St, AQ/EtOH														
	Hengchun, 1965														
B603881	Derris laxiflora Benth.	02	LE	05	2	1	1	1	15	Z	400.0	6/6	- 2.7	10.5/ 9.5	110
	Leguminosae	50	WM	05	2	1	1	3	04	07	400.0	6/6	- 9.0	5.6/ 6.3	88
	Lf St, AQ/EtOH	90	KB	16	5								ED50	M1.0 x 10(2)	
	Hengchun, 1965														
B603882	Derris sp.	02	LE	05	2	1	1	1	15	Z	200.0	6/6	- 1.9	9.8/ 9.0	108
	Leguminosae	50	WM	05	2	1	1	3	04	07	200.0	6/6	- 3.0	5.2/ 6.3	82
	Lf St, AQ/EtOH	90	KB	16	5						Slope	-0.72	ED50	5.6 x 10(1)	
	Hengchun, 1965														
B672908	Desmodium heterocarpum	06	LE	02	2	1	1	1	09	30	200.0	4/6	- 1.6	8.5/ 8.8	96
	(L.) DC.	02	PS	02	2	1	1	1	10	30	200.0	5/6	- 4.0	11.0/11.0	100
	Leguminosae	90	KB	16	5						Slope	-1.10	ED50	3.8 x 10(1)	
	Lf St, AQ/EtOH														
	Mt. Ch'i-hsing, 11/65														
B672885	Desmodium laxiflorum DC.	02	LE	02	2	1	1	1	09	30	400.0	4/6	- 0.6	8.5/ 8.4	101
	Leguminosae	02	PS	02	2	1	1	1	10	30	400.0	6/6	- 3.1	11.0/11.0	100
	Lf St, AQ/EtOH	90	KB	16	2						Slope	-0.58	ED50	5.5 x 10(1)	
	Liu-kuei, 11/66														

Table 2 *In Vitro* And *In Vivo* Data On Taiwan Plant Extracts

NSC NO.	BOTANICAL NAME	HOST	TEST SYS.	SCREENER	VEHICLE	ROUTE	DOSE REG.	DAY 1ST INJ.	NO. OF INJ.	DAY OF SAC.	DOSE	SURVIVORS	ANIMAL WT. DIFF.	TUMOR WT. OR SURVIVAL (T./C.)	PERCENT
B672796	Desmodium pulchellum	02	LE	06	2	1	1	1	09	30	400.0	5/6	0.8	8.6/ 8.5	101
	(L.) Benth.	06	PS	06	2	1	1	1	10	30	400.0	6/6	- 2.4	10.5/12.0	87
	Leguminosae	90	KB	06	9								ED50	M1.0 x 10(2)	
	Pl, AQ/EtOH														
	Mt. Ta-hsue, 01/67														
B672021	Desmodium sequax Wall.	02	LE	03	2	1	1	1	09	30	200.0	5/6	0.1	10.0/ 8.7	114
	var. sinuatum (Miq.)	02	PS	03	2	1	1	1	10	30	200.0	6/6	- 1.1	10.2/ 9.1	112
	Hosokawa	90	KB	16	5								ED50	M1.0 x 10(2)	
	Leguminosae														
	Lf St, AQ/EtOH														
	Chiayi, 01/67														
B672015	Dianella ensifolia DC.	02	LE	03	2	1	1	1	09	30	200.0	6/6	- 1.4	8.3/ 8.6	96
	Liliaceae	02	PS	03	2	1	1	1	10	30	200.0	6/6	- 1.3	9.2/ 9.1	101
	Pl, AQ/EtOH	90	KB	16	5								ED50	M1.0 x 10(2)	
	Chiayi, 01/67														
B672117	Dicranopteris dichotoma	02	LE	08	2	1	1	1	09	30	400.0	6/6	- 1.7	8.2/ 9.4	87
	Bernh.	02	PS	08	2	1	1	1	10	30	400.0	6/6	- 2.6	12.5/14.0	89
	Gleicheniaceae	90	KB	16	2								ED50	M1.0 x 10(2)	
	Lf St, AQ/EtOH														
	Mt. Kwan-in, 11/65														
B672902	Dicranopteris linearis	02	LE	02	2	1	1	1	09	30	75.0	5/6	- 0.9	9.6/ 8.9	107
	(Burn.) Wnderw	06	PS	02	2	1	1	1	09	30	75.0	5/6	1.3	10.0/11.0	90
	Gleicheniaceae	90	KB	16	5						Slope	-1.09	ED50	2.6 x 10(1)	
	Pl, AQ/EtOH														
	Mt. Ch'i-hsing, 11/65														
B672810	Digenea simplex (Wufl.) Ag.	02	LE	06	2	1	1	1	09	30	400.0	5/6	- 1.2	9.4/ 9.6	97
	Rhodomelaceae	02	PS	06	2	1	1	1	10	30	100.0	6/6	0.0	11.0/12.0	91
	Pl, AQ	90	KB	06	9								ED50	M1.0 x 10(2)	
	Tung-sha Islets, 07/69														

Table 2 *In Vitro* And *In Vivo* Data On Taiwan Plant Extracts

NSC NO.	BOTANICAL NAME	HOST	TEST SYS.	SCREENER	VEHICLE	ROUTE	DOSE REG.	DAY 1ST INJ.	NO. OF INJ.	DAY OF SAC.	DOSE	SURVIVORS	ANIMAL WT. DIFF.	TUMOR WT. OR SURVIVAL (T./C.)	PERCENT
B672809	Digenea simplex (Wufl.) Ag.	02	LE	06	2	1	1	1	09	30	400.0	6/6	0.3	10.3/ 9.4	109
	Rhodomelaceae	06	PS	06	2	1	1	1	10	30	400.0	5/6	- 2.7	12.5/13.0	96
	Pl, AQ/EtOH	90	KB	06	9								ED50	M1.0 x 10(2)	
	Tung-sha Islets, 07/69														
B672808	Digenea simplex (Wufl.) Ag.	02	LE	06	2	1	1	1	09	30	400.0	6/6	1.0	8.5/ 9.4	90
	Rhodomelaceae	06	PS	06	2	1	1	1	10	30	400.0	5/6	- 1.5	11.5/13.0	88
	Pl, EtOH	90	KB	06	9								ED50	M1.0 x 10(2)	
	Tung-sha Islets, 07/69														
B603883	Dillenia indica L.	02	LE	05	2	1	1	1	15	Z	200.0	6/6	- 1.0	9.2/ 9.0	102
	Dilleniaceae	50	WM	05	2	1	1	3	04	07	200.0	6/6	- 3.0	6.4/ 6.3	101
	Lf St, AQ/EtOH	90	KB	16	7								ED50	M1.0 x 10(2)	
	Hengchun, 1965														
B672828	Dioscorea bulvifera	02	LE	02	2	1	1	1	09	30	100.0	6/6	- 0.6	8.3/ 8.7	95
	L. (R. Tuh.)	02	PS	02	2	1	1	1	10	30	200.0	6/6	- 4.0	10.5/11.0	95
	Dioscoreaceae	90	KB	16	5						Slope	-1.14	ED50	2.7 x 10(1)	
	Lf Fr, AQ/EtOH														
	Mt. Ta-hsue, 01/67														
B626298	Diospyros eriantha Champ.	02	LE	08	8	1	1	1	15	Z	400.0	6/6	- 1.8	7.8/ 7.6	102
	Ebenaceae	50	WM	08	Y	1	1	3	04	07	400.0	5/6	- 1.0	5.9/ 8.7	67
	Lf St, AQ/EtOH	90	KB	16	5						Slope	-0.77	ED50	2.1 x 10(1)	
	Hengchun, 11/65														
B672881	Diospyros kaki Thunb.	02	LE	02	2	1	1	1	09	30	400.0	6/6	- 1.5	9.8/ 9.2	105
	Ebenaceae	02	PS	02	2	1	1	1	10	30	200.0	6/6	- 1.9	12.5/11.0	113
	Fr, AQ/EtOH	90	KB	16	5						Slope	-0.35	ED50	1.1 x 10(2)	
	Mt. Ta-hsue, 01/67														

Table 2 *In Vitro* And *In Vivo* Data On Taiwan Plant Extracts

NSC NO.	BOTANICAL NAME	HOST	TEST SYS.	SCREENER	VEHICLE	ROUTE	DOSE REG.	DAY 1ST INJ.	NO. OF INJ.	DAY OF SAC.	DOSE	SURVIVORS	ANIMAL WT. DIFF.	TUMOR WT. OR SURVIVAL (T./C.)	PERCENT
B672055	Diospyros kaki Thunb.	02	LE	03	8	1	1	1	09	30	400.0	6/6	0.9	8.8/ 8.8	100
	Ebenaceae	02	PS	03	8	1	1	1	10	30	400.0	6/6	- 0.3	11.0/12.4	88
	Lf St, AQ/EtOH	90	KB	16	F						Slope	-1.18	ED50	2.8 x 10(1)	
	Mt. Ta-hsue, 11/66														
B626230	Diospyros montana Roxb.	02	LE	03	8	1	1	1	15	Z	400.0	4/6	- 4.9	7.8/ 8.3	93
	Ebenaceae	50	WM	03	8	1	1	3	04	07	400.0	6/6	-12.0	6.5/11.3	57
	Lf St, AQ/EtOH	90	KB	16	5						Slope	-0.55	ED50	4.8 x 10(1)	
	Hengchun, 11/64														
B672150	Diospyros morrisiana Hance	06	LE	06	2	1	1	1	09	30	200.0	6/6	- 2.0	8.0/ 8.3	96
	Ebenaceae	06	PS	06	2	1	1	1	10	30	200.0	6/6	- 1.8	9.0/ 9.0	100
	Lf St, AQ/EtOH	90	KB	06	B						Slope	-0.44	ED50	1.0 x 10(2)	
	Liu-kuei, 11/66														
B626231	Diospyros utilis Hemsl.	02	LE	03	8	1	1	1	15	Z	400.0	6/6	- 1.9	8.2/ 8.3	98
	Ebenaceae	50	WM	03	8	1	1	3	04	07	400.0	5/7	- 5.0	5.6/10.5	53
	Lf St, AQ/EtOH	90	KB	16	5						Slope	-0.99	ED50	2.4 x 10(1)	
	Hengchun, 11/64														
B626290	Diplofatsia polycarpa Nakai	02	LE	08	8	1	1	1	15	Z	400.0	4/6	- 3.3	7.3/ 7.6	96
	Araliaceae	50	WM	08	8	1	1	3	04	07	400.0	7/7	- 1.0	5.0/ 6.7	74
	Pl, AQ/EtOH	90	KB	16	5						Slope	-0.17	ED50	M1.0 x 10(2)	
	Mt. Ali, 01/67														
B603885	Dovyalis hebecarpa Warb.	02	LE	05	2	1	1	1	15	Z	75.0	6/6	- 3.6	9.3/ 9.5	97
	Flacourtiaceae	50	WM	05	2	1	1	3	04	07	75.0	6/6	- 8.0	4.0/ 6.3	63
	Lf St, AQ/EtOH	90	KB	16	5								ED50	M1.0 x 10(2)	
	Hengchun, 1965														

Table 2 *In Vitro* And *In Vivo* Data On Taiwan Plant Extracts

NSC NO.	BOTANICAL NAME	HOST	TEST SYS.	SCREENER	VEHICLE	ROUTE	DOSE REG.	DAY 1ST INJ.	NO. OF INJ.	DAY OF SAC.	DOSE	SURVIVORS	ANIMAL WT. DIFF.	TUMOR WT. OR SURVIVAL (T./C.)	PERCENT
B626303	Dovyalis hebecarpa Warb.	02	LE	08	8	1	1	1	15	Z	400.0	6/6	- 1.7	7.5/ 7.6	98
	Flacourtiaceae	50	WM	08	Y	1	1	3	04	07	400.0	6/6	1.0	5.3/ 8.7	60
	Pl, AQ/EtOH	90	KB	16	5						Slope	-0.32	ED50	2.7 x 10(1)	
	Mt. Ali, 01/67														
B672194	Dryopteris morrisonensis	02	LE	06	2	1	1	1	09	30	400.0	6/6	0.0	9.0/ 9.4	95
	Hay.	02	PS	06	2	1	1	1	10	30	200.0	5/6	- 0.4	9.0/ 9.0	100
	Polypodiaceae	90	KB	06	B								ED50	M1.0 x 10(2)	
	Lf St, AQ/EtOH														
	Mt. Ho-huan, 07/66														
B672804	Dryopteris sparsa O. K.	06	LE	06	2	1	1	1	09	30	50.0	6/6	- 1.6	8.3/ 8.1	102
	Polypodiaceae	02	PS	06	2	1	1	1	10	30	100.0	6/6	- 3.4	10.0/11.0	90
	Pl, AQ/EtOH	90	KB	06	9						Slope	-1.03	ED50	2.5 x 10(1)	
	Mt. Ali, 11/66														
B603886	Drypetes yamadai K. & S.	02	LE	05	2	1	1	1	15	Z	400.0	5/6	- 2.8	10.6/ 9.5	111
	Euphorbiaceae	50	WM	05	2	1	1	3	04	07	400.0	6/6	- 5.0	6.6/ 6.3	104
	Lf St, AQ/EtOH	90	KB	16	2								ED50	M1.0 x 10(2)	
	Hengchun, 1965														
B672076	Ecdysanthera rosea	02	LE	08	2	1	1	1	09	30	400.0	6/6	- 2.0	10.8/ 9.9	109
	Hook. & Arn.	02	PS	08	2	1	1	1	10	30	400.0	6/6	- 2.0	11.0/11.0	100
	Apocynaceae	90	KB	16	5								ED50	M1.0 x 10(2)	
	Pl, AQ/EtOH														
	Liu-kuei, 11/66														
B672024	Ehretia taiwaniana Nakai	02	LE	03	2	1	1	1	09	30	400.0	6/6	- 1.3	8.8/ 8.5	102
	Boraginaceae	02	PS	03	2	1	1	1	10	30	400.0	4/6	- 1.9	10.5/ 9.1	115
	Lf St, AQ/EtOH	90	KB	16	2						Slope	-0.77	ED50	5.4 x 10(1)	
	Hengchun, 11/65														

Table 2 *In Vitro* And *In Vivo* Data On Taiwan Plant Extracts

NSC NO.	BOTANICAL NAME	HOST	TEST SYS.	SCREENER	VEHICLE	ROUTE	DOSE REG.	DAY 1ST INJ.	NO. OF INJ.	DAY OF SAC.	DOSE	SURVIVORS	ANIMAL WT. DIFF.	TUMOR WT. OR SURVIVAL (T./C.)	PERCENT
B603888	Elaeagnus sp.	02	LE	05	2	1	1	1	15	Z	400.0	6/6	- 1.7	10.0/ 9.5	105
	Elaeagnaceae	50	WM	05	2	1	1	3	04	07	400.0	6/6	- 8.0	6.3/ 6.3	100
	Lf St, AQ/EtOH	90	KB	16	5						Slope	-0.34	ED50	M1.0 x 10(2)	
	Hengchun, 1965														
B672829	Elaeocarpus japonicus	02	LE	02	2	1	1	1	09	30	18.0	6/6	1.3	8.2/ 9.0	91
	Sieb. & Zucc.	02	PS	02	2	1	1	1	10	30	35.0	6/6	- 1.6	10.0/11.0	90
	Elaeocarpaceae	90	KB	16	5						Slope	-1.14	ED50	2.7 x 10(1)	
	Lf St, AQ/EtOH														
	Mt. Ch'i-hsing, 11/66														
B603889	Elaeocarpus serratus L.	02	LE	05	2	1	1	1	15	Z	400.0	4/6	- 0.7	9.0/ 9.5	94
	Elaeocarpaceae	50	WM	05	2	1	1	3	04	07	400.0	6/6	- 3.0	5.5/ 6.3	87
	Lf St, AQ/EtOH	90	KB	16	5						Slope	-1.00	ED50	2.9 x 10(1)	
	Hengchun, 1965														
B672148	Eleocharis dulcis	06	LE	06	2	1	1	1	09	30	400.0	5/6	- 0.6	9.2/ 9.0	102
	(Burm. f.) Trin.	02	PS	06	2	1	1	1	09	20	400.0	6/6	- 0.6	11.5/11.0	104
	Cyperaceae	90	KB	06	B								ED50	M1.0 x 10(2)	
	Corm, AQ														
	Taiwan, 06/69														
B672149	Eleocharis dulcis	06	LE	06	2	1	1	1	09	30	400.0	6/6	- 0.4	9.0/ 9.0	100
	(Burm. f.) Trin.	02	PS	06	2	1	1	1	09	20	200.0	6/6	0.7	12.5/11.0	113
	Cyperaceae	90	KB	06	B								ED50	M1.0 x 10(2)	
	Corm, AQ/EtOH														
	Taiwan, 06/69														
B672764	Elephantopus spicatus Aubl.	02	LE	05	2	1	1	1	09	30	400.0	6/6	- 1.5	9.0/ 9.8	91
	Compositae	02	PS	05	2	1	1	1	10	29	400.0	6/6	- 2.2	11.0/ 9.5	115
	Pl, AQ/EtOH	90	KB	16	2						Slope	-0.70	ED50	3.9 x 10(1)	
	Liu-kuei, 11/66														

Table 2 *In Vitro* And *In Vivo* Data On Taiwan Plant Extracts

NSC NO.	BOTANICAL NAME	HOST	TEST SYS.	SCREENER	VEHICLE	ROUTE	DOSE REG.	DAY 1ST INJ.	NO. OF INJ.	DAY OF SAC.	DOSE	SURVIVORS	ANIMAL WT. DIFF.	TUMOR WT. OR SURVIVAL (T./C.)	PERCENT
B672126	Eleusine indica (L.) Gaertn.	02	LE	08	2	1	1	1	09	30	400.0	6/6	- 0.7	8.7/ 9.7	89
	Gramineae	02	PS	08	2	1	1	1	10	30	400.0	6/6	0.2	9.5/ 9.0	105
	Pl, AQ/EtOH	90	KB	16	5								ED50	M1.0 x 10(2)	
	Hengchun, 11/65														
B672187	Epilobium alpinum L.	02	LE	06	2	1	1	1	09	30	25.0	6/6	- 3.0	8.7/ 9.4	92
	Oenotheraceae	02	PS	06	2	1	1	1	10	30	25.0	6/6	- 4.2	7.0/ 7.0	100
	Pl, AQ/EtOH	90	KB	06	B						Slope	-1.12	ED50	2.5 x 10(1)	
	Mt. Ho-huan, 07/68														
B672013	Equisetum ramosissimum	02	LE	03	2	1	1	1	09	30	400.0	6/6	- 0.6	8.3/ 8.6	96
	Desv.	02	PS	03	2	1	1	1	10	30	400.0	6/6	- 1.4	10.7/ 9.0	118
	Equisetaceae	90	KB	16	5								ED50	M1.0 x 10(2)	
	Pl, AQ/EtOH														
	Chiayi, 01/67														
B603759	Erigeron canadensis L.	02	LE	05	2	1	1	1	Z	Z	500.0	6/6	- 1.5	9.2/ 9.1	101
	Compositae	50	WM	05	2	1	1	3	04	07	500.0	6/6	- 2.0	7.4/ 9.7	76
	Pl, EtOH	90	KB	06	B						Slope	-1.20	ED50	3.2 x 10(1)	
	Taipei, 1965														
B626269	Eriobotrya defiexa Nakai	02	LE	03	2	1	1	1	15	Z	400.0	6/6	- 1.3	9.0/ 8.7	103
	Rosaceae	50	WM	03	2	1	1	3	04	07	400.0	7/7	- 6.0	3.4/ 3.8	89
	Lf St, AQ/EtOH	90	KB	16	5						Slope	-0.30	ED50	1.1 x 10(2)	
	Hengchun, 11/64														
B626260	Erythrina variagata L.	02	LE	03	2	1	1	1	15	Z	400.0	6/6	- 3.3	8.3/ 8.7	95
	var. orientalis (L.) Merr.	50	WM	03	2	1	1	3	04	07	400.0	7/7	- 3.0	2.8/ 4.1	68
	Leguminosae	90	KB	16	5								ED50	M1.0 x 10(2)	
	Lf St, AQ/EtOH														
	Hengchun, 11/64														

Table 2 *In Vitro* And *In Vivo* Data On Taiwan Plant Extracts

NSC NO.	BOTANICAL NAME	HOST	TEST SYS.	SCREENER	VEHICLE	ROUTE	DOSE REG.	DAY 1ST INJ.	NO. OF INJ.	DAY OF SAC.	DOSE	SURVIVORS	ANIMAL WT. DIFF.	TUMOR WT. OR SURVIVAL (T./C.)	PERCENT
B672802	Eucalyptus longifolia Link	06	LE	06	2	1	1	1	09	30	50.0	5/6	- 2.2	8.2/ 8.1	101
	Myrtaceae	02	PS	06	2	1	1	1	10	30	100.0	6/6	- 3.1	10.0/11.0	90
	Lf St, AQ/EtOH	90	KB	06	9								ED50	M1.0 x 10(2)	
	Liu-kuei, 11/66														
B603890	Eucalyptus robusta Smith	02	LE	05	2	1	1	1	15	Z	100.0	6/6	- 2.1	8.3/ 9.0	92
	Myrtaceae	50	WM	05	2	1	1	3	04	07	100.0	6/6	- 4.0	6.2/ 6.3	98
	Lf St, AQ/EtOH	90	KB	16	5						Slope	-1.10	ED50	2.4 x 10(1)	
	Hengchun, 1965														
B626295	Euonymus echinatus Wall.	02	LE	08	8	1	1	1	15	Z	200.0	6/6	0.4	8.8/ 8.9	98
	Celastraceae	50	WM	08	Y	1	1	3	04	07	200.0	6/6	- 6.0	5.3/ 7.3	72
	Pl, AQ/EtOH	90	KB	16	5						Slope	-0.62	ED50	1.8 x 10(1)	
	Mt. Ali, 01/67														
B603760	Eupatorium formosanum Hay.	02	LE	05	2	1	1	1	Z	Z	500.0	6/6	- 0.6	8.5/ 9.1	83
	Compositae	50	WM	05	2	1	1	3	04	07	500.0	6/6	- 4.0	5.7/ 9.7	53
	Pl, EtOH	90	KB	06	B						Slope	-0.66	ED50	6.3 x 10(1)	
	Taipei, 1965														
B672123	Eupatorium quasitripartitum	02	LE	08	2	1	1	1	09	30	400.0	6/6	- 0.6	9.0/ 9.4	95
	Hay.	02	PS	08	2	1	1	1	10	30	400.0	6/6	0.9	9.5/ 9.0	105
	Compositae	90	KB	16	2						Slope	-0.66	ED50	8.7 x 10(1)	
	Pl, AQ/EtOH														
	Hengchun, 11/65														
B672897	Eupatorium tashiroi Hay.	02	LE	02	2	1	1	1	09	30	400.0	5/6	0.2	8.6/ 9.4	91
	Compositae	02	PS	02	2	1	1	1	10	30	400.0	6/6	- 1.9	10.5/10.5	100
	Lf St, AQ/EtOH	90	KB	16	2								ED50	M1.0 x 10(2)	
	Mt. Ch'i-hsing, 11/66														

Table 2 *In Vitro* And *In Vivo* Data On Taiwan Plant Extracts

NSC NO.	BOTANICAL NAME	HOST	TEST SYS.	SCREENER	VEHICLE	ROUTE	DOSE REG.	DAY 1ST INJ.	NO. OF INJ.	DAY OF SAC.	DOSE	SURVIVORS	ANIMAL WT. DIFF.	TUMOR WT. OR SURVIVAL (T./C.)	PERCENT
B672915	Eurya crenatifolia	06	LE	02	2	1	1	1	09	30	100.0	5/6	- 4.0	8.8/ 8.8	100
	(Yamam.) Kobuski	06	PS	02	2	1	1	1	09	30	50.0	6/6	0.2	10.0/11.0	90
	Theaceae	90	KB	16	5								ED50	M1.0 x 10(2)	
	Lf St, AQ/EtOH														
	Mt. Ch'i-hsing, 11/66														
B626326	Eurya glaberrima Hay.	02	LE	08	Y	1	1	1	15	Z	400.0	5/6	- 2.9	7.6/ 8.2	92
	Theaceae	50	WM	08	8	1	1	3	04	07	400.0	5/6	-14.0	5.2/ 8.0	65
	Pl, AQ/EtOH	90	KB	16	5						Slope	-1.10	ED50	2.3 x 10(1)	
	Mt. Ali, 01/67														
B672792	Eutrema wasabi Maxim.	06	LE	06	2	1	1	1	09	30	37.5	6/6	- 1.1	9.0/ 8.2	109
	Cruciferae	02	PS	06	2	1	1	1	10	30	75.0	6/6	- 4.9	10.0/11.0	90
	Pl, AQ/EtOH	90	KB	06	9								ED50	M1.0 x 10(2)	
	Mt. Ali, 11/66														
B672815	Evodia confusa Merr.	06	LE	06	9	1	1	1	09	30	400.0	6/6	- 0.6	9.2/ 8.5	108
	Rutaceae	02	PS	06	2	1	1	1	10	30	400.0	6/6	- 0.9	10.0/11.0	90
	Lf St, AQ/EtOH	90	KB	06	9								ED50	M1.0 x 10(2)	
	Mt. Ch'i-hsing, 11/66														
B603891	Excoecaria orientalis	02	LE	05	2	1	1	1	15	Z	150.0	6/6	- 1.9	9.3/ 9.5	97
	Pax & Hoffm.	50	WM	05	2	1	1	3	04	07	150.0	6/6	- 6.0	4.9/ 6.3	77
	Euphorbiaceae	90	KB	16	2						Slope	-0.96	ED50	2.4 x 10(1)	
	Lf St, AQ/EtOH														
	Hengchun, 1965														
B672816	Fagara cuspidata	06	LE	06	9	1	1	1	09	30	400.0	6/6	- 1.9	8.7/ 8.5	102
	(Champ.) Hay.	02	PS	06	2	1	1	1	10	30	400.0	6/6	- 1.3	10.0/11.0	90
	Rutaceae	90	KB	06	9								ED50	M1.0 x 10(2)	
	Pl, AQ/EtOH														
	Mt. Ta-hsue, 01/67														

Table 2 *In Vitro* And *In Vivo* Data On Taiwan Plant Extracts

NSC NO.	BOTANICAL NAME	HOST	TEST SYS.	SCREENER	VEHICLE	ROUTE	DOSE REG.	DAY 1ST INJ.	NO. OF INJ.	DAY OF SAC.	DOSE	SURVIVORS	ANIMAL WT. DIFF.	TUMOR WT. OR SURVIVAL (T./C.)	PERCENT
B672801	Ficus awkeotsang Makino	06	LE	06	2	1	1	1	09	30	100.0	5/6	- 1.9	7.8/ 8.1	96
	Moraceae	02	PS	06	2	1	1	1	10	30	100.0	6/6	- 4.2	10.0/11.0	90
	Lf St, AQ/EtOH	90	KB	06	9								ED50	M1.0 x 10(2)	
	Liu-kuei, 11/66														
B603892	Ficus beecheyana	02	LE	05	2	1	1	1	15	Z	200.0	6/6	- 1.1	10.0/ 9.5	105
	Hook. & Arn.	50	WM	05	2	1	1	3	04	07	200.0	6/6	0	5.9/ 6.3	93
	Moraceae	90	KB	16	5						Slope	-0.98	ED50	2.6 x 10(1)	
	Lf St, AQ/EtOH														
	Hengchun, 1965														
B603893	Ficus foveolata Wall.	02	LE	05	2	1	1	1	15	Z	150.0	5/6	- 3.1	7.8/ 9.0	86
	Moraceae	50	WM	05	2	1	1	3	04	07	150.0	6/6	- 7.0	4.6/ 6.3	73
	Lf St, AQ/EtOH	90	KB	16	5								ED50	M1.0 x 10(2)	
	Hengchun, 1965														
B672073	Ficus megacarpa Merr.	02	LE	08	2	1	1	1	09	30	400.0	6/6	- 1.8	9.7/ 9.9	97
	Moraceae	02	PS	08	2	1	1	1	10	30	400.0	6/6	- 2.4	10.5/11.0	95
	Lf St, AQ/EtOH	90	KB	16	5						Slope	-0.67	ED50	5.5 x 10(1)	
	Liu-kuei, 11/66														
B672776	Ficus nervosa Heyne	02	LE	05	2	1	1	1	09	30	400.0	6/6	- 0.6	8.7/ 9.8	88
	Moraceae	02	PS	05	2	1	1	1	10	29	400.0	6/6	- 0.7	10.5/ 9.5	110
	Lf St, AQ/EtOH	90	KB	16	5						Slope	-0.34	ED50	M1.0 x 10(2)	
	Chiayi, 11/66														
B603894	Ficus rigida Bl.	02	LE	05	2	1	1	1	15	Z	400.0	6/6	- 0.5	11.2/ 9.5	117
	Moraceae	50	WM	05	2	1	1	3	04	07	400.0	6/6	- 6.0	5.5/ 6.3	87
	Lf St, AQ/EtOH	90	KB	16	5						Slope	-0.95	ED50	2.0 x 10(1)	
	Hengchun, 1965														

Table 2 *In Vitro* And *In Vivo* Data On Taiwan Plant Extracts

NSC NO.	BOTANICAL NAME	HOST	TEST SYS.	SCREENER	VEHICLE	ROUTE	DOSE REG.	DAY 1ST INJ.	NO. OF INJ.	DAY OF SAC.	DOSE	SURVIVORS	ANIMAL WT. DIFF.	TUMOR WT. OR SURVIVAL (T./C.)	PERCENT
B672025	Ficus stipulosa Miq.	02	LE	03	2	1	1	1	09	30	200.0	6/6	- 1.9	9.3/ 8.6	108
	Moraceae	02	PS	03	2	1	1	1	10	30	200.0	6/6	- 2.6	10.0/ 9.1	109
	Lf St, AQ/EtOH	90	KB	16	2								ED50	Ml.0 x 10(2)	
	Hengchun, 11/65														
B626253	Ficus wightiana Wall.	02	LE	03	8	1	1	1	15	Z	400.0	6/6	- 0.9	9.0/ 8.7	103
	Moraceae	50	WM	03	8	1	1	3	04	07	400.0	6/7	- 1.0	3.5/ 4.1	85
	Lf St, AQ/EtOH	90	KB	16	5						Slope	-0.26	ED50	Ml.0 x 10(2)	
	Hengchun, 11/64														
B626241	Flagellaria indica L.	02	LE	03	2	1	1	1	15	Z	400.0	6/6	- 1.0	8.3/ 8.7	95
	Flagellariaceae	50	WM	03	2	1	1	3	04	07	400.0	7/7	- 3.0	8.7/11.1	78
	Lf St, AQ/EtOH	90	KB	16	5								ED50	Ml.0 x 10(2)	
	Hengchun, 11/64														
B603895	Fluggea virosa Baill.	02	LE	05	2	1	1	1	15	Z	100.0	6/6	- 2.4	9.0/ 9.0	100
	Euphorbiaceae	50	WM	05	2	1	1	3	04	07	200.0	6/6	0	3.4/ 7.2	47
	Lf St, AQ/EtOH	90	KB	16	5						Slope	-0.78	ED50	3.5 x 10(1)	
	Hengchun, 1965														
B603896	Fraxinus griffithii	02	LE	05	2	1	1	1	15	Z	100.0	6/6	- 1.3	9.3/ 9.0	103
	C. B. Clarke	50	WM	05	2	1	1	3	04	07	100.0	6/6	- 4.0	6.2/ 6.3	98
	Oleaceae	90	KB	16	5								ED50	Ml.0 x 10(2)	
	Lf St, AQ/EtOH														
	Hengchun, 1965														
B626255	Fraxinus insularis Hemsl.	02	LE	03	8	1	1	1	15	Z	400.0	6/6	0.1	8.8/ 8.7	101
	Oleaceae	50	WM	03	8	1	1	3	04	07	400.0	7/7	- 8.0	2.6/ 4.1	63
	St, AQ/EtOH	90	KB	16	5								ED50	Ml.0 x 10(2)	
	Hengchun, 11/64														

Table 2 *In Vitro* And *In Vivo* Data On Taiwan Plant Extracts

NSC NO.	BOTANICAL NAME	HOST	TEST SYS.	SCREENER	VEHICLE	ROUTE	DOSE REG.	DAY 1ST INJ.	NO. OF INJ.	DAY OF SAC.	DOSE	SURVIVORS	ANIMAL WT. DIFF.	TUMOR WT. OR SURVIVAL (T./C.)	PERCENT
B672007	Galium formosense Ohwi	02	LE	03	2	1	1	1	09	30	400.0	6/6	- 2.2	8.7/ 8.9	97
	Rubiaceae	02	PS	03	2	1	1	1	10	30	400.0	6/6	- 1.0	7.8/ 9.0	86
	Lf St, AQ/EtOH	90	KB	16	5								ED50	M1.0 x 10(2)	
	Mt. Ta-hsue, 01/67														
B672752	Galium rotundifolium L.	06	LE	06	2	1	1	1	09	30	400.0	6/6	- 0.2	9.2/ 9.0	102
	Rubiaceae	06	PS	06	2	1	1	1	10	30	400.0	6/6	- 2.1	9.0/ 9.0	100
	Pl, AQ/EtOH	90	KB	06	B								ED50	M1.0 x 10(2)	
	Mt. Ho-huan, 07/66														
B626305	Garcinia spicata Hook. f.	02	LE	08	8	1	1	1	15	Z	400.0	6/6	- 2.2	8.0/ 7.6	105
	Guttiferae	50	WM	08	8	1	1	3	04	07	400.0	7/7	- 8.0	3.9/ 8.3	46
	Lf St, AQ/EtOH	90	KB	16	5						Slope	-0.34	ED50	M1.0 x 10(2)	
	Hengchun, 11/65														
B672925	Gaultheria borneensis	02	PS	09	2	1	1	1	09	30	100.0	6/6	0.1	12.0/10.0	120
	Stapf	90	KB	06	B								ED50	M1.0 x 10(2)	
	Ericaceae														
	Lf St, AQ/EtOH														
	Mt. Ali, 11/66														
B672125	Gaultheria cumingiana Vidal	02	LE	08	2	1	1	1	09	30	200.0	6/6	- 1.9	8.8/ 8.8	100
	Ericaceae	02	PS	08	2	1	1	1	10	30	50.0	6/6	0.2	11.0/12.0	91
	Lf St, AQ/EtOH	90	KB	16	5						Slope	-1.15	ED50	2.7 x 10(1)	
	Mt. Ta-hsue, 01/67														
B672043	Gaultheria itoana Hay.	02	LE	03	8	1	1	1	09	30	400.0	6/6	- 0.1	8.3/ 8.8	94
	Ericaceae	02	PS	03	8	1	1	1	10	30	400.0	6/6	- 1.0	10.2/ 9.1	112
	Lf St, AQ/EtOH	90	KB	16	F						Slope	-1.29	ED50	3.1 x 10(1)	
	Mt. Ta-hsue, 11/66														

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NSC NO.	BOTANICAL NAME	HOST	TEST SYS.	SCREENER	VEHICLE	ROUTE	DOSE REG.	DAY 1ST INJ.	NO. OF INJ.	DAY OF SAC.	DOSE	SURVIVORS	ANIMAL WT. DIFF.	TUMOR WT. OR SURVIVAL (T./C.)	PERCENT
B672177	Gentiana arisanensis Hay.	06	LE	06	2	1	1	1	09	30	400.0	6/6	- 2.1	9.0/ 8.9	101
	Gentianaceae	02	PS	06	2	1	1	1	10	30	400.0	6/6	- 1.1	10.5/12.0	87
	Px, AQ/EtOH	90	KB	06	B								ED50	Ml.0 x 10(2)	
	Mt. Ho-huan, 07/68														
B672769	Gentiana formosana Hay.	02	LE	05	2	1	1	1	09	30	200.0	6/6	0.3	9.7/ 9.7	100
	Gentianaceae	02	PS	05	2	1	1	1	10	29	200.0	6/6	- 1.1	9.5/ 9.5	100
	Pl, AQ/EtOH	90	KB	16	5								ED50	Ml.0 x 10(2)	
	Mt. Ta-hsue, 01/67														
B672078	Geophila herbacea Kuntze	02	LE	08	2	1	1	1	09	30	400.0	6/6	- 3.0	8.8/ 9.9	88
	Rubiaceae	02	PS	08	2	1	1	1	10	30	400.0	5/5	- 4.2	10.0/11.0	90
	Lf St, AQ/EtOH	90	KB	16	5						Slope	-0.75	ED50	3.8 x 10(1)	
	Liu-kuei, 11/66														
B672178	Geranium hayatanum Ohwi	06	LE	06	2	1	1	1	09	30	400.0	5/6	- 0.4	9.2/ 9.1	101
	Geraniaceae	02	PS	06	2	1	1	1	10	30	400.0	5/6	0.3	10.0/11.0	90
	Pl, AQ/EtOH	90	KB	06	B								ED50	Ml.0 x 10(2)	
	Mt. Ho-huan, 07/68														
B672028	Geranium nepalense Sweet	02	LE	03	8	1	1	1	09	30	200.0	6/6	- 3.0	9.2/ 8.7	105
	Geraniaceae	02	PS	03	8	1	1	1	10	30	200.0	6/6	- 4.5	11.3/ 9.1	124
	Lf St, AQ/EtOH	90	KB	16	F						Slope	-1.18	ED50	2.8 x 10(1)	
	Mt. Ali, 11/66														
B672179	Geranium uniflorum Hay.	02	LE	06	2	1	1	1	09	30	25.0	6/6	- 2.6	9.2/ 9.4	97
	Geraniaceae	02	PS	06	2	1	1	1	10	30	50.0	6/6	- 3.3	8.0/ 7.0	114
	Pl, AQ/EtOH	90	KB	06	B						Slope	-0.94	ED50	1.9 x 10(1)	
	Mt. Ho-huan, 07/68														

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NSC NO.	BOTANICAL NAME	HOST	TEST SYS.	SCREENER	VEHICLE	ROUTE	DOSE REG.	DAY 1ST INJ.	NO. OF INJ.	DAY OF SAC.	DOSE	SURVIVORS	ANIMAL WT. DIFF.	TUMOR WT. OR SURVIVAL (T./C.)	PERCENT
B626301	Glochidion album Boerl.	02	LE	08	8	1	1	1	15	Z	80.0	6/6	- 2.6	8.0/ 8.8	90
	Euphorbiaceae	50	WM	08	Y	1	1	3	04	07	80.0	5/6	-11.0	4.5/ 7.3	61
	Lf St, AQ/EtOH	90	KB	16	5						Slope	-0.50	ED50	5.2 x 10(1)	
	Hengchun, 11/65														
B672146	Gnaphalium formosanum Hay.	06	LE	06	2	1	1	1	09	30	400.0	6/6	- 2.5	8.8/ 8.9	98
	Compositae	06	PS	06	2	1	1	1	10	30	400.0	5/6	- 1.4	9.5/11.0	86
	Pl, AQ/EtOH	90	KB	06	B								ED50	M1.0 x 10(2)	
	Mt. Ta-hsue, 11/66														
B672857	Goniothalamus amuyon Merr.	02	LE	02	2	1	1	1	09	30	200.0	4/6	- 2.8	10.0/ 9.7	103
	Annonaceae	02	PS	02	2	1	1	1	10	30	100.0	6/6	0.1	11.0/11.0	100
	Lf St, AQ/EtOH	90	KB	16	5						Slope	-0.65	ED50	5.7 x 10(1)	
	Hengchun, 11/65														
B626243	Gonocaryum diospyrosifolium	02	LE	03	8	1	1	1	15	Z	400.0	6/6	- 0.8	8.2/ 8.7	94
	Hay.	50	WM	03	8	1	1	3	04	07	400.0	7/7	- 8.0	10.1/11.1	90
	Icacinaceae	90	KB	16	5								ED50	M1.0 x 10(2)	
	Lf St, AQ/EtOH														
	Hengchun, 11/64														
B603898	Grevillea robusta A. Cunn.	02	LE	05	2	1	1	1	15	Z	400.0	6/6	- 1.0	9.2/ 9.1	101
	Proteaceae	50	WM	05	2	1	1	3	04	07	400.0	6/6	- 3.0	5.5/ 6.3	87
	Lf St, AQ/EtOH	90	KB	16	5								ED50	M1.0 x 10(2)	
	Hengchun, 1965														
B626226	Haematoxylon campechianum L.	02	LE	03	2	1	1	1	15	Z	400.0	6/6	- 0.9	8.3/ 8.3	100
	Leguminosae	50	WM	03	2	1	1	3	04	07	400.0	7/7	2.0	7.1/10.5	67
	Lf St, AQ/EtOH	90	KB	16	5								ED50	M1.0 x 10(2)	
	Hengchun, 11/64														

Table 2 *In Vitro* And *In Vivo* Data On Taiwan Plant Extracts

NSC NO.	BOTANICAL NAME	HOST	TEST SYS.	SCREENER	VEHICLE	ROUTE	DOSE REG.	DAY 1ST INJ.	NO. OF INJ.	DAY OF SAC.	DOSE	SURVIVORS	ANIMAL WT. DIFF.	TUMOR WT. OR SURVIVAL (T./C.)	PERCENT
B672130	Hedyotis nantoensis Hay.	02	LE	08	2	1	1	1	09	30	400.0	6/6	- 3.3	9.0/ 9.7	92
	Rubiaceae	02	PS	08	2	1	1	1	10	30	400.0	6/6	- 1.3	9.0/ 9.0	100
	Pl, AQ/EtOH	90	KB	16	5						Slope	-0.51	ED50	1.1 x 10(2)	
	Liu-kuei, 11/66														
B672843	Helicia formosana Hemsl.	02	LE	02	C	1	1	1	09	30	400.0	5/6	- 4.5	9.4/ 8.3	113
	Proteaceae	02	PS	02	C	1	1	1	10	30	400.0	5/6	- 3.5	9.5/10.0	95
	Lf St, AQ/EtOH	90	KB	16	2						Slope	-1.31	ED50	3.2 x 10(1)	
	Mt. Ch'i-hsing, 11/66														
B672116	Hibiscus syriacus L.	02	LE	08	2	1	1	1	09	30	400.0	6/6	- 1.5	9.3/ 9.4	98
	Malvaceae	02	PS	08	2	1	1	1	10	30	400.0	6/6	- 0.1	14.5/14.0	103
	Lf St, AQ/EtOH	90	KB	16	5						Slope	-0.25	ED50	Ml.0 x 10(2)	
	Hengchun, 11/65														
B626309	Hibiscus taiwanensis Hu	02	LE	08	Y	1	1	1	15	Z	400.0	6/6	- 1.3	7.0/ 7.6	92
	Malvaceae	50	WM	08	Y	1	1	3	04	07	400.0	7/7	- 2.0	4.4/ 6.7	65
	Pl, AQ/EtOH	90	KB	16	5								ED50	Ml.0 x 10(2)	
	Mt. Ali, 01/67														
B603899	Hiptage bengalensis Kurz.	02	LE	05	2	1	1	1	15	Z	100.0	6/6	- 1.9	9.0/ 9.0	100
	Malpighiaceae	50	WM	05	2	1	1	3	04	07	200.0	6/6	- 1.0	5.5/ 6.3	87
	Lf St, AQ/EtOH	90	KB	16	5						Slope	-0.40	ED50	Ml.0 x 10(2)	
	Hengchun, 1965														
B672780	Histiopteris incisa	02	LE	05	2	1	1	1	09	30	200.0	6/6	- 1.1	9.5/ 9.7	97
	J. Smith	02	PS	05	2	1	1	1	10	29	200.0	6/6	- 2.0	11.0/ 9.5	115
	Polypodiaceae	90	KB	16	2						Slope	-0.46	ED50	Ml.0 x 10(2)	
	Pl, AQ/EtOH														
	Mt. Ta-hsue, 01/67														

Table 2 *In Vitro* And *In Vivo* Data On Taiwan Plant Extracts

NSC NO.	BOTANICAL NAME	HOST	TEST SYS.	SCREENER	VEHICLE	ROUTE	DOSE REG.	DAY 1ST INJ.	NO. OF INJ.	DAY OF SAC.	DOSE	SURVIVORS	ANIMAL WT. DIFF.	TUMOR WT. OR SURVIVAL (T./C.)	PERCENT
B672045	Hugeria lasiostemon Sasaki	02	LE	03	2	1	1	1	09	30	200.0	6/6	- 1.3	8.7/ 8.8	98
	Ericaceae	02	PS	03	2	1	1	1	10	30	200.0	6/6	- 1.4	11.3/10.1	111
	Lf St, AQ/EtOH	90	KB	16	2								ED50	M1.0 x 10(2)	
	Mt. Ta-hsue, 11/66														
B626236	Hura crepitans L.	02	LE	03	8	1	1	1	15	Z	200.0	6/6	- 2.1	8.5/ 8.7	97
	Euphorbiaceae	50	WM	03	8	1	1	3	04	07	200.0	7/7	- 4.0	6.4/11.1	57
	Lf St, AQ/EtOH	90	KB	16	5								ED50	M1.0 x 10(2)	
	Hengchun, 11/64														
B603900	Hydnocarpus anthelminthica	02	LE	05	2	1	1	1	15	Z	400.0	6/6	0.7	9.7/ 9.1	106
	Pierre	50	WM	05	2	1	1	3	04	07	400.0	6/6	- 5.0	5.3/ 6.3	87
	Flacourtiaceae	90	KB	16	5						Slope	-0.66	ED50	5.6 x 10(1)	
	Lf St, AQ/EtOH														
	Hengchun, 1965														
B603901	Hydnocarpus wightiana Bl.	02	LE	05	2	1	1	1	15	Z	400.0	6/6	- 1.9	9.2/ 9.1	101
	Flacourtiaceae	50	WM	05	2	1	1	3	04	07	400.0	6/6	- 9.0	3.3/ 6.3	52
	Lf St, AQ/EtOH	90	KB	16	5						Slope	-0.57	ED50	8.1 x 10(1)	
	Hengchun, 1965														
B626323	Hydrangea angustipetala	02	LE	08	Y	1	1	1	15	Z	400.0	6/6	- 2.1	8.5/ 8.2	103
	Hay.	50	WM	08	Y	1	1	3	04	07	400.0	6/6	3.0	4.5/ 8.6	52
	Saxifragaceae	90	KB	16	5						Slope	-0.60	ED50	5.8 x 10(1)	
	Pl, AQ/EtOH														
	Mt. Ali, 01/67														
B626331	Hydrangea aspera D. Don	02	LE	08	8	1	1	1	15	Z	400.0	6/6	- 2.9	7.3/ 8.2	89
	Saxifragaceae	50	WM	08	8	1	1	3	04	07	400.0	6/6	- 1.0	3.9/ 8.6	45
	Pl, AQ/EtOH	90	KB	16	5						Slope	-0.92	ED50	1.9 x 10(1)	
	Mt. Ali, 01/67														

Table 2 *In Vitro* And *In Vivo* Data On Taiwan Plant Extracts

NSC NO.	BOTANICAL NAME	HOST	TEST SYS.	SCREENER	VEHICLE	ROUTE	DOSE REG.	DAY 1ST INJ.	NO. OF INJ.	DAY OF SAC.	DOSE	SURVIVORS	ANIMAL WT. DIFF.	TUMOR WT. OR SURVIVAL (T./C.)	PERCENT
B672003	Hydrangea integrifolia Hay.	02	LE	03	2	1	1	1	09	30	400.0	6/6	- 0.9	9.0/ 8.9	101
	Saxifragaceae	02	PS	03	2	1	1	1	10	30	400.0	6/6	- 1.7	10.5/ 9.1	115
	Lf St, AQ/EtOH	90	KB	16	5								ED50	Ml.0 x 10(2)	
	Mt. Ta-hsue, 01/67														
B672783	Hydrangea scandens Seringe	02	LE	05	2	1	1	1	09	30	20.0	6/6	- 2.4	9.8/10.1	97
	Saxifragaceae	02	PS	05	2	1	1	1	10	30	10.0	6/6	- 3.6	11.5/10.0	115
	Lf St, AQ/EtOH	90	KB	16	5						Slope	-0.96	ED50	2.2 x 10(1)	
	Liu-kuei, 11/66														
B626324	Hydrangea scandens Seringe	02	LE	08	Y	1	1	1	15	Z	400.0	6/6	- 1.9	7.7/ 8.2	93
	subsp. chinensis	50	WM	08	Y	1	1	3	04	07	400.0	4/6	- 9.0	4.9/ 8.6	56
	(Maxim.) McClint	90	KB	16	5						Slope	-0.73	ED50	5.1 x 10(1)	
	Saxifragaceae														
	Pl, AQ/EtOH														
	Mt. Ali, 01/67														
B603902	Hymenaea courbaril L.	02	LE	05	2	1	1	1	15	Z	200.0	5/6	- 0.6	9.2/ 9.0	102
	Leguminosae	50	WM	05	2	1	1	3	04	07	400.0	6/6	- 1.0	6.3/ 6.3	100
	Lf St, AQ/EtOH	90	KB	16	5								ED50	Ml.0 x 10(2)	
	Hengchun, 1965														
B672842	Hypolepis punctata Bedd.	02	LE	02	2	1	1	1	09	30	200.0	6/6	- 2.6	9.3/ 8.7	106
	Polypodiaceae	02	PS	02	2	1	1	1	10	30	200.0	6/6	- 2.1	9.5/11.0	86
	Pl, AQ/EtOH	90	KB	16	5								ED50	Ml.0 x 10(2)	
	Mt. Ta-hsue, 01/67														
B672093	Hyptis capitata Jacq.	02	LE	08	2	1	1	1	09	30	400.0	6/6	- 1.3	9.5/ 9.9	95
	Labiatae	02	PS	08	2	1	1	1	10	30	300.0	5/6	- 1.7	10.0/11.0	90
	Pl, AQ/EtOH	90	KB	16	5						Slope	-0.47	ED50	Ml.0 x 10(2)	
	Chiayi, 11/66														

Table 2 *In Vitro* And *In Vivo* Data On Taiwan Plant Extracts

NSC NO.	BOTANICAL NAME	HOST	TEST SYS.	SCREENER	VEHICLE	ROUTE	DOSE REG.	DAY 1ST INJ.	NO. OF INJ.	DAY OF SAC.	DOSE	SURVIVORS	ANIMAL WT. DIFF.	TUMOR WT. OR SURVIVAL (T./C.)	PERCENT
B672144	Ilex hanceana Maxim.	06	LE	06	2	1	1	1	09	30	400.0	6/6	- 0.8	9.8/ 8.9	110
	Aquifoliaceae	06	PS	06	2	1	1	1	10	30	400.0	4/6	- 2.1	10.0/11.0	90
	Lf St, AQ/EtOH	90	KB	06	B								ED50	M1.0 x 10(2)	
	Mt. Ta-hsue, 11/66														
B672894	Ilex pubescens	02	LE	02	2	1	1	1	09	30	400.0	5/6	- 0.3	9.0/ 9.4	95
	Hook. & Arn.	02	PS	02	2	1	1	1	10	30	400.0	4/6	0.7	10.5/12.0	87
	Aquifoliaceae	90	KB	16	5								ED50	M1.0 x 10(2)	
	Lf St, AQ/EtOH														
	Mt. Ch'i-hsing, 11/66														
B672036	Ilex rotunda Thunb.	02	LE	03	2	1	1	1	09	30	400.0	6/6	- 1.1	8.5/ 8.5	100
	Aquifoliaceae	02	PS	03	2	1	1	1	10	30	400.0	6/6	- 1.9	12.2/12.4	98
	Lf, AQ/EtOH	90	KB	16	2								ED50	M1.0 x 10(2)	
	Hengchun, 12/67														
B672034	Ilex rotunda Thunb.	02	LE	03	8	1	1	1	09	30	400.0	6/6	- 0.6	8.7/ 8.5	102
	Aquifoliaceae	02	PS	03	8	1	1	1	10	30	400.0	6/6	- 1.4	11.7/12.4	94
	Rt, AQ/EtOH	90	KB	16	2								ED50	M1.0 x 10(2)	
	Hengchun, 12/67														
B672035	Ilex rotunda Thunb.	02	LE	03	8	1	1	1	09	30	400.0	6/6	- 0.8	8.7/ 8.5	102
	Aquifoliaceae	02	PS	03	8	1	1	1	10	30	400.0	6/6	- 0.9	11.5/12.4	92
	St, AQ/EtOH	90	KB	16	5								ED50	M1.0 x 10(2)	
	Hengchun, 12/67														
B603903	Ilex rotunda Thunb.	02	LE	05	2	1	1	1	15	Z	50.0	6/6	- 2.6	8.7/ 9.0	96
	Aquifoliaceae	50	WM	05	2	1	1	3	04	07	50.0	6/6	- 3.0	6.0/ 6.3	95
	Lf St, AQ/EtOH	90	KB	16	E						Slope	-1.20	ED50	4.5 x 10(1)	
	Hengchun, 1965														

Table 2 *In Vitro* And *In Vivo* Data On Taiwan Plant Extracts

NSC NO.	BOTANICAL NAME	HOST	TEST SYS.	SCREENER	VEHICLE	ROUTE	DOSE REG.	DAY 1ST INJ.	NO. OF INJ.	DAY OF SAC.	DOSE	SURVIVORS	ANIMAL WT. DIFF.	TUMOR WT. OR SURVIVAL (T./C.)	PERCENT
B603904	Ilex sp.	02	LE	05	2	1	1	1	15	2	400.0	5/6	- 1.6	10.2/ 9.1	112
	Aquifoliaceae	50	WM	05	2	1	1	3	04	07	400.0	6/6	3.0	6.1/ 6.3	96
	Lf St, AQ/EtOH	90	KB	16	2								ED50	M1.0 x 10(2)	
	Hengchun, 1965														
B672083	Illicium anisatum L.	02	LE	08	2	1	1	1	09	30	400.0	6/6	- 0.8	9.8/ 9.9	98
	Magnoliaceae	02	PS	08	2	1	1	1	10	30	400.0	6/6	- 1.6	12.0/11.0	109
	Pl, AQ/EtOH	90	KB	16	5						Slope	-0.46	ED50	M1.0 x 10(2)	
	Mt. Ch'i-hsing, 11/65														
B672774	Illicium arborescens Hay.	02	LE	05	2	1	1	1	09	30	400.0	5/6	- 1.3	10.0/ 9.8	102
	Magnoliaceae	02	PS	05	2	1	1	1	10	29	400.0	4/6	- 2.0	11.5/ 9.5	121
	Lf St, AQ/EtOH	90	KB	16	5								ED50	M1.0 x 10(2)	
	Mt. Ta-hsue, 01/67														
B672800	Illicium philippinense	02	LE	06	2	1	1	1	09	30	400.0	6/6	- 1.3	8.8/ 8.5	103
	Merr.	06	PS	06	2	1	1	1	10	30	400.0	6/6	- 1.7	11.0/12.0	91
	Magnoliaceae	90	KB	06	9								ED50	M1.0 x 10(2)	
	Lf St, AQ/EtOH														
	Mt. Ta-hsue, 01/67														
B672765	Ipomoea obscura Ker.	02	LE	05	2	1	1	1	09	30	200.0	6/6	- 1.8	9.8/ 9.7	101
	Convolvulaceae	02	PS	05	2	1	1	1	10	29	200.0	6/6	- 2.7	11.0/ 9.5	115
	Pl, AQ/EtOH	90	KB	16	2						Slope	-1.11	ED50	2.7 x 10(1)	
	Liu-kuei, 11/66														
B672862	Ipomoea sp.	02	LE	02	2	1	1	1	09	30	35.0	6/6	- 1.2	8.8/ 9.6	91
	Convolvulaceae	02	PS	02	2	1	1	1	10	30	17.0	6/6	- 0.9	10.5/12.0	87
	Lf St, AQ/EtOH	90	KB	16	5						Slope	-0.45	ED50	6.0 x 10(1)	
	Hengchun, 11/65														

Table 2 *In Vitro* And *In Vivo* Data On Taiwan Plant Extracts

NSC NO.	BOTANICAL NAME	HOST	TEST SYS.	SCREENER	VEHICLE	ROUTE	DOSE REG.	DAY 1ST INJ.	NO. OF INJ.	DAY OF SAC.	DOSE	SURVIVORS	ANIMAL WT. DIFF.	TUMOR WT. OR SURVIVAL (T./C.)	PERCENT
B626299	Itea arisanensis Hay.	02	LE	08	8	1	1	1	15	Z	400.0	5/6	- 1.1	8.2/ 7.6	107
	Saxifragaceae	50	WM	08	Y	1	1	3	04	07	400.0	5/6	3.0	5.4/ 8.7	62
	Lf St, AQ/EtOH	90	KB	16	5						Slope	-0.78	ED50	2.2 x 10(1)	
	Hengchun, 11/65														
B672020	Ixeris chinensis Nakai	02	LE	03	2	1	1	1	09	30	200.0	6/6	- 1.0	8.7/ 8.7	100
	Compositae	02	PS	03	2	1	1	1	10	30	200.0	6/6	- 1.9	9.5/ 9.1	104
	Pl, AQ/EtOH	90	KB	16	5								ED50	Ml.0 x 10(2)	
	Chiayi, 01/67														
B672824	Ixeris microcephala Nakai	02	LE	02	2	1	1	1	09	30	200.0	6/6	- 0.1	8.3/ 8.7	95
	Compositae	02	PS	02	2	1	1	1	10	30	200.0	6/6	- 2.9	9.5/11.0	86
	Pl, AQ/EtOH	90	KB	16	5								ED50	Ml.0 x 10(2)	
	Chiayi, 01/67														
B603905	Ixora chinensis Lam.	02	LE	05	2	1	1	1	15	Z	400.0	6/6	- 1.1	9.7/ 9.1	106
	Rubiaceae	50	WM	05	2	1	1	3	04	07	400.0	6/6	- 5.0	5.1/ 6.3	80
	Lf St, AQ/EtOH	90	KB	16	5						Slope	-0.76	ED50	3.6 x 10(1)	
	Hengchun, 1965														
B672841	Jasminum subtriplinerve Bl.	02	LE	02	2	1	1	1	09	30	150.0	6/6	- 2.1	9.3/ 8.7	106
	Oleaceae	02	PS	02	2	1	1	1	10	30	150.0	5/6	- 3.2	10.5/12.0	87
	Lf St, AQ/EtOH	90	KB	16	2						Slope	-1.30	ED50	3.2 x 10(1)	
	Mt. Ali, 11/66														
B626302	Jatropha curcas L.	02	LE	08	8	1	1	1	15	Z	400.0	4/6	- 4.4	9.0/ 7.6	118
	Euphorbiaceae	50	WM	08	8	1	1	3	04	07	400.0	5/6	- 4.0	5.1/ 8.7	58
	Lf St, AQ/EtOH	90	KB	16	5						Slope	-0.13	ED50	Ml.0 x 10(2)	
	Hengchun, 11/65														

Table 2 *In Vitro* And *In Vivo* Data On Taiwan Plant Extracts

NSC NO.	BOTANICAL NAME	HOST	TEST SYS.	SCREEN	VEHICLE	ROUTE	DOSE REG.	DAY 1ST INJ.	NO. OF INJ.	DAY OF SAC.	DOSE	SURVIVORS	ANIMAL WT. DIFF.	TUMOR WT. OR SURVIVAL (T./C.)	PERCENT
B672182	Juncus modicus N. E. Br.	02	LE	06	2	1	1	1	09	30	400.0	6/6	0.6	8.7/ 9.4	92
	Juncaceae	02	PS	06	2	1	1	1	10	30	400.0	6/6	- 0.6	10.5/11.0	95
	Pl, AQ/EtOH	90	KB	06	B										
	Mt. Ho-huan, 07/68														
B672190	Juniperus morrisonicola	06	LE	06	2	1	1	1	09	30	100.0	5/6	- 3.7	8.8/ 9.0	97
	Hay.	06	PS	06	2	1	1	1	10	30	100.0	6/6	- 1.6	8.0/ 9.0	88
	Pinaceae	90	KB	06	B								ED50	Ml.0 x 10(2)	
	Lf St, AQ/EtOH														
	Mt. Ho-huan, 07/68														
B672109	Jussiaea erecta L.	02	LE	08	2	1	1	1	09	30	200.0	6/6	- 3.0	9.8/ 8.6	113
	Onagraceae	02	PS	08	2	1	1	1	10	30	100.0	4/5	- 1.5	13.0/12.0	108
	Pl, AQ/EtOH	90	KB	16	5						Slope	-1.16	ED50	2.7 x 10(1)	
	Mt. Kwan-in, 11/65														
B603906	Kigelia pinnata DC.	02	LE	05	2	1	1	1	15	Z	400.0	6/6	- 1.4	10.0/ 9.1	109
	Bignoniaceae	50	WM	05	2	1	1	3	04	07	400.0	6/6	- 6.0	6.0/ 6.3	95
	Lf St, AQ/EtOH	90	KB	16	2								ED50	Ml.0 x 10(2)	
	Hengchun, 1965														
B603907	Kleinhovia hospita L.	02	LE	05	2	1	1	1	15	Z	400.0	6/6	- 1.8	9.2/ 9.1	101
	Sterculiaceae	50	WM	05	2	1	1	3	04	07	400.0	6/6	- 2.0	5.2/ 6.3	82
	Lf St, AQ/EtOH	90	KB	16	5						Slope	-0.24	ED50	Ml.0 x 10(2)	
	Hengchun, 1965														
B672040	Kyllinga brevifolia Rottb.	02	LE	03	2	1	1	1	09	30	200.0	6/6	0.4	9.2/ 8.8	104
	Cyperaceae	02	PS	03	2	1	1	1	10	30	200.0	6/6	- 2.0	10.8/ 9.1	118
	Pl, AQ/EtOH	90	KB	16	2						Slope	-1.22	ED50	2.9 x 10(1)	
	Liu-kuei, 11/66														

Table 2 *In Vitro* And *In Vivo* Data On Taiwan Plant Extracts

NSC NO.	BOTANICAL NAME	HOST	TEST SYS.	SCREENER	VEHICLE	ROUTE	DOSE REG.	DAY 1ST INJ.	NO. OF INJ.	DAY OF SAC.	DOSE	SURVIVORS	ANIMAL WT. DIFF.	TUMOR WT. OR SURVIVAL (T./C.)	PERCENT
B603909	Lagerstroemia sp. Lythraceae Lf St, AQ/EtOH Hengchun, 1965	02 50 90	LE WM KB	05 05 16	2 2 5	1 1	1 1	1 3	15 04	Z 07	400.0 400.0 Slope	5/6 6/6 -0.66	- 1.0 0 ED50	10.2/ 9.1 4.2/ 7.3 7.6 x 10(1)	112 57
B603910	Lagerstroemia speciosa Pers. Lythraceae Lf St, AQ/EtOH Hengchun, 1965	02 50 90	LE WM KB	05 05 16	2 2 E	1 1	1 1	1 3	15 04	Z 07	200.0 400.0 Slope	6/6 4/6 -1.20	- 3.0 - 7.0 ED50	9.0/ 9.0 4.3/ 5.9 2.9 x 10(1)	100 72
B672847	Lasianthus fordii Hance Rubiaceae Lf St, AQ/EtOH Liu-kuei, 11/66	02 02 90	LE PS KB	02 02 16	C C 2	1 1	1 1	1 1	09 10	30 30	400.0 400.0	5/6 6/6	- 1.1 - 2.5 ED50	8.8/ 8.3 11.5/10.0 M1.0 x 10(2)	106 115
B672812	Lasianthus nigrocarpus Masam. Rubiaceae Fr, AQ/EtOH Mt. Ta-hsue, 01/67	06 02 90	LE PS KB	06 06 06	2 2 9	1 1	1 1	1 1	09 10	30 30	400.0 400.0	6/6 6/6	0.3 - 1.3 ED50	9.0/ 8.8 14.0/14.0 M1.0 x 10(2)	102 100
B672813	Lasianthus plagiophyllus Hance Rubiaceae Lf St, AQ/EtOH Liu-kuei, 11/66	06 02 90	LE PS KB	06 06 06	2 2 9	1 1	1 1	1 1	09 10	30 30	400.0 400.0	6/6 6/6	- 1.5 - 1.8 ED50	8.7/ 8.8 13.0/14.0 M1.0 x 10(2)	98 92
B603911	Lasianthus sp. Rubiaceae Lf St, AQ/EtOH Hengchun, 1965	02 50 90	LE WM KB	05 05 16	2 2 5	1 1	1 1	1 3	15 04	Z 07	400.0 400.0	6/6 6/6	- 0.4 - 1.0 ED50	8.3/ 9.1 7.4/ 7.3 M1.0 x 10(2)	91 101

Table 2 *In Vitro* And *In Vivo* Data On Taiwan Plant Extracts

NSC NO.	BOTANICAL NAME	HOST	TEST SYS.	SCREENER	VEHICLE	ROUTE	DOSE REG.	DAY 1ST INJ.	NO. OF INJ.	DAY OF SAC.	DOSE	SURVIVORS	ANIMAL WT. DIFF.	TUMOR WT. OR SURVIVAL (T./C.)	PERCENT
B626257	Latania commersonii Gu.	02	LE	03	8	1	1	1	15	Z	400.0	4/6	- 3.9	9.5/ 8.7	109
	Palmae	50	WM	03	8	1	1	3	04	07	400.0	7/7	- 3.0	1.9/ 4.1	46
	Lf, AQ/EtOH	90	KB	16	5						Slope	-1.10	ED50	2.8 x 10(1)	
	Hengchun, 11/64														
B672884	Leea manillensis Walp.	02	LE	02	2	1	1	1	09	30	100.0	6/6	- 2.2	8.3/ 8.4	98
	Vitaceae	02	PS	02	2	1	1	1	10	30	100.0	5/6	- 1.3	10.5/11.0	95
	Lf St, AQ/EtOH	90	KB	16	5						Slope	-0.13	ED50	M1.0 x 10(2)	
	Hengchun, 11/65														
B603912	Leleba dolichoclada Odash.	02	LE	05	2	1	1	1	15	Z	400.0	6/6	- 0.5	9.0/ 9.1	98
	Gramineae	50	WM	05	2	1	1	3	04	07	400.0	6/6	- 3.0	7.9/ 7.3	108
	Lf St, AQ/EtOH	90	KB	16	5								ED50	M1.0 x 10(2)	
	Hengchun, 1965														
B626242	Leleba floribunda Nakai	02	LE	03	2	1	1	1	15	Z	400.0	6/6	- 1.5	8.3/ 8.7	95
	Gramineae	50	WM	03	2	1	1	3	04	07	400.0	7/7	0	8.2/11.1	75
	Lf St, AQ/EtOH	90	KB	16	5								ED50	M1.0 x 10(2)	
	Hengchun, 11/64														
B603913	Leleba sp.	02	LE	05	2	1	1	1	15	Z	400.0	6/6	- 0.6	9.2/ 9.1	101
	Gramineae	50	WM	05	2	1	1	3	04	07	400.0	6/6	- 5.0	3.9/ 7.3	53
	Lf St, AQ/EtOH	90	KB	16	5								ED50	M1.0 x 10(2)	
	Hengchun, 1965														
B672170	Leontopodium microphyllum	06	LE	06	2	1	1	1	09	30	400.0	5/6	- 1.2	9.0/ 8.9	101
	Hay.	02	PS	06	2	1	1	1	10	30	400.0	6/6	0.7	11.0/12.0	91
	Compositae	90	KB	06	B								ED50	M1.0 x 10(2)	
	Pl, AQ/EtOH														
	Mt. Ho-huan, 07/68														

Table 2 *In Vitro* And *In Vivo* Data On Taiwan Plant Extracts

NSC NO.	BOTANICAL NAME	HOST	TEST SYS.	SCREENER	VEHICLE	ROUTE	DOSE REG.	DAY 1ST INJ.	NO. OF INJ.	DAY OF SAC.	DOSE	SURVIVORS	ANIMAL WT. DIFF.	TUMOR WT. OR SURVIVAL (T./C.)	PERCENT
B672757	Lepidagathis formosensis	02	LE	05	2	1	1	1	09	30	100.0	5/6	- 2.1	9.0/ 9.7	92
	Clarke	02	PS	05	2	1	1	1	10	30	50.0	6/6	- 1.2	11.5/10.0	115
	Acanthaceae	90	KB	16	5								ED50	M1.0 x 10(2)	
	Pl, AQ/EtOH														
	Chiayi, 11/66														
B626258	Licuala spinosa Thunb.	02	LE	03	2	1	1	1	15	Z	400.0	5/6	- 0.7	8.4/ 8.7	96
	Palmae	50	WM	03	2	1	1	3	04	07	400.0	7/7	- 8.0	4.7/ 4.1	114
	Lf St, AQ/EtOH	90	KB	16	5								ED50	M1.0 x 10(2)	
	Hengchun, 11/64														
B672777	Ligustrum pricei Hay.	02	LE	05	2	1	1	1	09	30	150.0	6/6	- 3.0	9.7/10.1	96
	Oleaceae	02	PS	05	2	1	1	1	10	30	75.0	6/6	- 2.7	10.0/10.0	100
	Lf St, AQ/EtOH	90	KB	16	5						Slope	-0.40	ED50	M1.0 x 10(2)	
	Mt. Ta-hsue, 11/66														
B672797	Lilium formosanum Wall.	02	LE	06	2	1	1	1	09	30	400.0	6/6	- 2.9	8.7/ 8.5	102
	Liliaceae	02	PS	06	2	1	1	1	10	30	100.0	5/6	- 0.6	10.0/11.0	90
	Lf St, AQ/EtOH	90	KB	06	9								ED50	M1.0 x 10(2)	
	Mt. Ta-hsue, 01/67														
B626245	Lindera akoensis Hay.	02	LE	03	8	1	1	1	15	Z	400.0	5/6	- 1.3	8.4/ 8.7	96
	Lauraceae	50	WM	03	8	1	1	3	04	07	200.0	6/6	- 6.0	4.0/ 8.8	45
	Lf St, AQ/EtOH	90	KB	16	5						Slope	-0.98	ED50	2.3 x 10(1)	
	Hengchun, 11/64														
B672112	Liquidambar formosana Hance	02	LE	08	2	1	1	1	09	30	400.0	5/5	- 2.3	9.0/ 9.4	95
	Hamamelidaceae	02	PS	08	2	1	1	1	10	30	400.0	6/6	- 2.2	11.5/11.0	104
	Lf St, AQ/EtOH	90	KB	16	2						Slope	-1.08	ED50	2.5 x 10(1)	
	Hengchun, 11/65														

Table 2 *In Vitro* And *In Vivo* Data On Taiwan Plant Extracts

NSC NO.	BOTANICAL NAME	HOST	TEST SYS.	SCREENER	VEHICLE	ROUTE	DOSE REG.	DAY 1ST INJ.	NO. OF INJ.	DAY OF SAC.	DOSE	SURVIVORS	ANIMAL WT. DIFF.	TUMOR WT. OR SURVIVAL (T./C.)	PERCENT
B672870	Liriope muscari L.M. Bailey	02	LE	02	2	1	1	1	09	30	400.0	6/6	- 3.6	8.8/ 9.1	96
	Liliaceae	02	PS	02	2	1	1	1	10	30	400.0	6/6	- 1.6	13.0/12.0	108
	Pl, AQ/EtOH	90	KB	16	5						Slope	-0.16	ED50	2.1 x 10(1)	
	Liu-kuei, 11/65														
B672834	Litsea cubeba (Lour.) Pers.	02	LE	02	2	1	1	1	09	30	150.0	6/6	- 1.9	9.0/ 8.7	103
	Lauraceae	02	PS	02	2	1	1	1	10	30	75.0	6/6	- 0.5	11.0/10.0	110
	Lf St, AQ/EtOH	90	KB	16	5						Slope	-0.33	ED50	M1.0 x 10(2)	
	Mt. Ch'i-hsing, 11/66														
B626293	Lonicera acuminata Wall.	02	LE	08	8	1	1	1	15	Z	400.0	6/6	- 0.3	8.0/ 7.6	105
	Caprifoliaceae	50	WM	08	8	1	1	3	04	07	400.0	6/6	0	7.3/ 8.7	83
	Pl, AQ/EtOH	90	KB	16	5						Slope	-0.50	ED50	1.0 x 10(2)	
	Mt. Ali, 01/67														
B672091	Lonicera kawakamii	02	LE	08	2	1	1	1	09	30	400.0	6/6	- 0.8	9.2/ 9.9	92
	(Hay.) Masam.	02	PS	08	2	1	1	1	10	30	400.0	6/6	- 0.6	10.5/11.0	95
	Caprifoliaceae	90	KB	16	5								ED50	M1.0 x 10(2)	
	Pl, AQ/EtOH														
	Chiayi, 11/66														
B672011	Lonicera transarisanensis	02	LE	03	2	1	1	1	09	30	400.0	6/6	- 0.7	9.2/ 8.6	106
	Hay.	02	PS	03	2	1	1	1	10	30	400.0	6/6	- 1.6	9.0/ 8.0	112
	Caprifoliaceae	90	KB	16	5								ED50	M1.0 x 10(2)	
	Lf St, AQ/EtOH														
	Mt. Ta-hsue, 01/67														
B672184	Loranthus owatarii Hay.	06	LE	06	2	1	1	1	09	30	100.0	6/6	- 1.3	9.2/ 9.0	102
	Loranthaceae	06	PS	06	2	1	1	1	10	30	100.0	6/6	- 1.7	9.0/ 9.0	100
	Px, AQ/EtOH	90	KB	06	B								ED50	M1.0 x 10(2)	
	Mt. Ho-huen, 07/68														

Table 2 *In Vitro* And *In Vivo* Data On Taiwan Plant Extracts

NSC NO.	BOTANICAL NAME	HOST	TEST SYS.	SCREENER	VEHICLE	ROUTE	DOSE REG.	DAY 1ST INJ.	NO. OF INJ.	DAY OF SAC.	DOSE	SURVIVORS	ANIMAL WT. DIFF.	TUMOR WT. OR SURVIVAL (T./C.)	PERCENT
B672778	Ludwigia octovalvis	02	LE	05	2	1	1	1	09	30	200.0	6/6	- 2.0	9.0/ 9.7	92
	(Jacq.) Raven	02	PS	05	2	1	1	1	10	29	200.0	6/6	- 2.9	11.0/ 9.5	115
	Onagraceae	90	KB	16	5						Slope	-0.43	ED50	M1.0 x 10(2)	
	Pl, AQ/EtOH														
	Mt. Ta-hsue, 01/67														
B672114	Lycium chinense Mill.	02	LE	08	2	1	1	1	09	30	400.0	5/6	- 2.2	8.4/ 9.4	89
	Solanaceae	02	PS	08	2	1	1	1	10	30	400.0	6/6	- 1.1	12.5/11.0	113
	Pl, AQ/EtOH	90	KB	16	5								ED50	M1.0 x 10(2)	
	Mt. Kwan-in, 11/65														
B672118	Lycopodium cernuum L.	02	LE	08	2	1	1	1	09	30	400.0	6/6	- 2.2	8.8/ 9.4	93
	Lycopodiaceae	02	PS	08	2	1	1	1	10	30	400.0	6/6	- 1.3	12.5/14.0	89
	Pl, AQ/EtOH	90	KB	16	5								ED50	M1.0 x 10(2)	
	Mt. Kwan-in, 11/65														
B672186	Lycopodium clavatum L.	02	LE	06	2	1	1	1	09	30	400.0	6/6	0.0	8.7/ 9.4	92
	Lycopodiaceae	02	PS	06	2	1	1	1	10	30	400.0	6/6	- 1.3	10.0/11.0	90
	Pl, AQ/EtOH	90	KB	06	B								ED50	M1.0 x 10(2)	
	Mt. Ho-huan, 07/68														
B672128	Lygodium japonicum	02	LE	08	2	1	1	1	09	30	400.0	6/6	- 1.1	9.5/ 9.7	97
	(Thunb.) Sw.	02	PS	08	2	1	1	1	10	30	400.0	6/6	- 1.3	12.0/10.0	120
	Schizaeaceae	90	KB	16	5								ED50	M1.0 x 10(2)	
	Northern Taiwan, 11/65														
B672770	Lysionotus warleyensis	02	LE	05	2	1	1	1	09	30	400.0	4/6	- 2.3	11.0/ 9.8	112
	Willm.	02	PS	05	2	½	1	1	10	29	400.0	6/6	- 1.5	11.0/ 9.5	115
	Gesneriaceae	90	KB	16	5						Slope	-0.44	ED50	1.1 x 10(2)	
	Lf St, AQ/EtOH														
	Mt. Ta-hsue, 01/67														

Table 2 *In Vitro* And *In Vivo* Data On Taiwan Plant Extracts

NSC NO.	BOTANICAL NAME	HOST	TEST SYS.	SCREENER	VEHICLE	ROUTE	DOSE REG.	DAY 1ST INJ.	NO. OF INJ.	DAY OF SAC.	DOSE	SURVIVORS	ANIMAL WT. DIFF.	TUMOR WT. OR SURVIVAL (T./C.)	PERCENT
B626232	Maba buxifolia (Rottb.) Pers. Ebenaceae Lf St, AQ/EtOH Hengchun, 11/64	02 50 90	LE WM KB	03 03 16	8 8 2	1 1	1 1	1 3	15 04	Z 07	400.0 400.0	6/6 6/6	- 1.5 - 1.0 ED50	8.3/ 8.3 7.7/ 9.6 M1.0 x 10(2)	100 80
B672108	Macaranga tanarius (L.) Muell. Arg. Euphorbiaceae Rt St, AQ/EtOH Mt. Kwan-in, 11/65	02 02 90	LE PS KB	08 08 16	2 2 5	1 1	1 1	1 1	09 10	30 30	400.0 400.0	6/6 6/6	- 0.9 - 1.6 ED50	9.7/ 9.7 13.5/11.0 M1.0 x 10(2)	100 122
B672794	Machilus arisanensis (Hay.) Hay. Lauraceae Lf St, AQ/EtOH Mt. Ch'i-hsing, 11/66	02 02 90	LE PS KB	06 06 06	2 2 9	1 1	1 1	1 1	09 10	30 30	400.0 200.0 Slope	5/6 5/6 -0.55	- 2.9 - 4.5 ED50	8.6/ 8.5 10.5/11.0 8.6 x 10(1)	101 95
B626246	Machilus kusanoi Hay. Lauraceae Lf St, AQ/EtOH Hengchun, 11/64	02 50 90	LE WM KB	03 03 16	8 8 5	1 1	1 1	1 3	15 04	Z 07	400.0 400.0	6/6 7/7	- 1.0 1.0 ED50	8.7/ 8.7 7.9/11.1 M1.0 x 10(2)	100 71
B626247	Machilus obovatifolia Kaneh. & Sasaki Lauraceae Lf St, AQ/EtOH Hengchun, 11/64	02 50 90	LE WM KB	03 03 16	2 2 5	1 1	1 1	1 3	15 04	Z 07	400.0 400.0	6/6 7/7	- 1.1 -11.0 ED50	7.7/ 8.7 8.9/11.1 M1.0 x 10(2)	88 80
B672883	Machilus thunbergii Sieb. & Zucc. Lauraceae Lf St, AQ/EtOH Hengchun, 11/65	02 02 90	LE PS KB	02 02 16	C 2 5	1 1	1 1	1 1	09 10	30 30	100.0 100.0 Slope	5/6 6/6 -1.15	- 1.5 - 1.9 ED50	8.8/ 8.4 11.0/11.0 2.7 x 10(1)	104 100

Table 2 *In Vitro* And *In Vivo* Data On Taiwan Plant Extracts

NSC NO.	BOTANICAL NAME	HOST	TEST SYS.	SCREENER	VEHICLE	ROUTE	DOSE REG.	DAY 1ST INJ.	NO. OF INJ.	DAY OF SAC.	DOSE	SURVIVORS	ANIMAL WT. DIFF.	TUMOR WT. OR SURVIVAL (T./C.)	PERCENT
B672065	Machilus zuihoensis Hay.	02	LE	03	2	1	1	1	09	30	400.0	6/6	- 1.8	9.0/ 8.8	102
	Lauraceae	02	PS	03	2	1	1	1	10	30	400.0	6/6	- 2.1	11.5/11.6	99
	Lf St, AQ/EtOH	90	KB	16	F						Slope	-1.10	ED50	2.6 x 10(1)	
	Hengchun, 11/66														
B603762	Machilus zuihoensis Hay.	02	LE	05	2	1	1	1	Z	Z	500.0	6/6	- 0.2	9.5/ 9.1	104
	Lauraceae	50	WM	05	2	1	1	3	04	07	400.0	6/6	- 2.0	7.6/ 9.7	78
	Pl, EtOH	90	KB	06	B								ED50	M1.0 x 10(2)	
	Taipei, 1965														
B672858	Maesa japonica	02	LE	02	2	1	1	1	09	30	5.0	6/6	- 1.8	9.2/ 9.8	93
	(Hornst.) Moritz.	02	PS	02	2	1	1	1	10	30	1.2	6/6	- 1.4	12.0/11.0	109
	Myrsinaceae	90	KB	16	2						Slope	-0.96	ED50	2.3 x 10(1)	
	Lf St, AQ/EtOH														
	Mt. Ta-hsue, 01/67														
B603918	Magnolia grandiflora L.	02	LE	05	2	1	1	1	15	Z	400.0	6/6	- 0.4	10.2/ 9.8	104
	Magnoliaceae	50	WM	05	2	1	1	3	04	07	400.0	6/6	- 2.0	4.7/ 6.6	71
	Lf St, AQ/EtOH	90	KB	16	5								ED50	M1.0 x 10(2)	
	Hengchun, 1965														
B672823	Mahonia oiwakensis Hay.	02	LE	02	2	1	1	1	09	30	100.0	6/6	- 0.5	8.7/ 8.7	100
	Berberidaceae	02	PS	02	2	1	1	1	10	30	200.0	6/6	- 2.1	11.0/11.0	100
	Lf St, AQ/EtOH	90	KB	16	5						Slope	-0.54	ED50	1.1 x 10(2)	
	Mt. Ch'i-hsing, 11/66														
B626237	Mallotus paniculatus	02	LE	03	2	1	1	1	15	Z	400.0	6/6	- 0.5	8.5/ 8.7	97
	Muell. Arg.	50	WM	03	2	1	1	3	04	07	400.0	7/7	- 2.0	6.4/11.1	57
	Euphorbiaceae	90	KB	16	5						Slope	-0.24	ED50	M1.0 x 10(2)	
	Lf St, AQ/EtOH														
	Hengchun, 11/64														

Table 2 *In Vitro* And *In Vivo* Data On Taiwan Plant Extracts

NSC NO.	BOTANICAL NAME	HOST	TEST SYS.	SCREENER	VEHICLE	ROUTE	DOSE REG.	DAY 1ST INJ.	NO. OF INJ.	DAY OF SAC.	DOSE	SURVIVORS	ANIMAL WT. DIFF.	TUMOR WT. OR SURVIVAL (T./C.)	PERCENT
B672107	Mallotus repandus	02	LE	08	2	1	1	1	09	30	400.0	6/6	- 3.4	8.8/ 9.7	90
	Muell. Arg.	02	PS	08	2	1	1	1	10	30	200.0	6/6	- 2.0	11.0/11.0	100
	Euphorbiaceae	90	KB	16	5						Slope	-0.18	ED50	M1.0 x 10(2)	
	Pl, AQ/EtOH														
	Mt. Ta-hsue, 11/65														
B626238	Manihot glaziovii Muell Arg.	02	LE	03	8	1	1	1	15	Z	100.0	6/6	- 1.9	8.5/ 8.7	97
	Euphorbiaceae	50	WM	03	8	1	1	3	04	07	100.0	7/7	- 6.0	7.6/11.1	68
	Lf St, AQ/EtOH	90	KB	16	5						Slope	-0.97	ED50	3.1 x 10(1)	
	Hengchun, 11/64														
B672864	Manihot utilissima Pohl.	02	LE	02	2	1	1	1	09	30	400.0	6/6	- 2.9	9.5/ 9.1	104
	Euphorbiaceae	02	PS	02	2	1	1	1	10	30	400.0	5/6	- 1.6	9.0/ 9.0	100
	Lf St, AQ/EtOH	90	KB	16	5								ED50	M1.0 x 10(2)	
	Chiayi, 11/65														
B672793	Mariscus cyperinus Vahl	02	LE	06	2	1	1	1	09	30	400.0	6/6	- 1.2	8.5/ 8.5	100
	Cyperaceae	02	PS	06	2	1	1	1	10	30	100.0	6/6	- 1.5	12.5/11.0	113
	Pl, AQ/EtOH	90	KB	06	9								ED50	M1.0 x 10(2)	
	Mt. Ch'i-hsing, 11/66														
B672873	Medinilla sp.	02	LE	02	2	1	1	1	09	30	75.0	6/6	- 3.2	8.2/ 8.4	97
	Melastomataceae	02	PS	02	2	1	1	1	10	30	75.0	6/6	- 0.3	11.5/11.0	104
	Lf St, AQ/EtOH	90	KB	16	5								ED50	M1.0 x 10(2)	
	Hengchun, 11/65														
B626239	Melanolepis multiglandulosa	02	LE	03	8	1	1	1	15	Z	200.0	6/6	- 1.4	8.5/ 8.7	97
	Reichb. f. & Zoll.	50	WM	03	8	1	1	3	04	07	200.0	7/7	- 1.0	9.0/11.1	81
	Euphorbiaceae	90	KB	16	2								ED50	M1.0 x 10(2)	
	Lf St, AQ/EtOH														
	Hengchun, 11/64														

Table 2 *In Vitro* And *In Vivo* Data On Taiwan Plant Extracts

NSC NO.	BOTANICAL NAME	HOST	TEST SYS.	SCREENER	VEHICLE	ROUTE	DOSE REG.	DAY 1ST INJ.	NO. OF INJ.	DAY OF SAC.	DOSE	SURVIVORS	ANIMAL WT. DIFF.	TUMOR WT. OR SURVIVAL (T./C.)	PERCENT
B672890	Melothria formosana Hay.	02	LE	02	2	1	1	1	09	30	400.0	6/6	- 0.5	8.7/ 8.4	103
	Cucurbitaceae	02	PS	02	2	1	1	1	10	30	400.0	6/6	- 1.6	11.0/11.0	100
	Pl, AQ/EtOH	90	KB	16	2						Slope	-0.52	ED50	Ml.0 x 10(2)	
	Mt. Ch'i-hsing, 11/66														
B672839	Michelia champaca L.	02	LE	02	C	1	1	1	09	30	400.0	5/6	- 1.6	9.2/ 8.3	110
	Magnoliaceae	02	PS	02	2	1	1	1	10	30	200.0	6/6	- 1.2	10.0/11.0	90
	Lf St, AQ/EtOH	90	KB	16	2								ED50	Ml.0 x 10(2)	
	Mt. Ch'i-hsing, 11/66														
B672005	Microsorium fortunei	02	LE	03	8	1	1	1	09	30	400.0	6/6	- 2.0	8.3/ 8.9	93
	(Moore) Ching	02	PS	03	8	1	1	1	10	30	400.0	4/6	- 4.3	9.3/ 9.1	102
	Polypodiaceae	90	KB	16	5								ED50	Ml.0 x 10(2)	
	Lf St, AQ/EtOH														
	Chiayi, 01/67														
B672868	Mimosa pudica L.	02	LE	02	2	1	1	1	09	30	400.0	6/6	- 1.8	10.0/ 9.1	109
	Leguminosae	02	PS	02	2	1	1	1	10	30	400.0	6/6	- 3.4	14.0/12.0	116
	Pl, AQ/EtOH	90	KB	16	5						Slope	-0.21	ED50	Ml.0 x 10(2)	
	Hengchun, 11/65														
B672869	Mimosa sp.	02	LE	02	2	1	1	1	09	30	400.0	6/6	- 2.7	9.2/ 9.1	101
	Leguminosae	02	PS	02	2	1	1	1	10	30	400.0	6/6	- 0.8	14.5/12.0	120
	Lf St, AQ/EtOH	90	KB	16	5						Slope	-0.26	ED50	Ml.0 x 10(2)	
	Hengchun, 11/65														
B603919	Miscanthus sinensis Anders.	02	LE	05	2	1	1	1	15	Z	400.0	6/6	- 0.4	9.2/ 9.8	93
	Gramineae	50	WM	05	2	1	1	3	04	07	400.0	6/6	- 1.0	5.5/ 6.6	83
	Lf St, AQ/EtOH	90	KB	16	5								ED50	Ml.0 x 10(2)	
	Hengchun, 1965														

Table 2 *In Vitro* And *In Vivo* Data On Taiwan Plant Extracts

NSC NO.	BOTANICAL NAME	HOST	TEST SYS.	SCREENER	VEHICLE	ROUTE	DOSE REG.	DAY 1ST INJ.	NO. OF INJ.	DAY OF SAC.	DOSE	SURVIVORS	ANIMAL WT. DIFF.	TUMOR WT. OR SURVIVAL (T./C.)	PERCENT
B626254	Morus australis Poir.	02	LE	03	2	1	1	1	15	Z	400.0	6/6	- 1.7	8.5/ 8.7	97
	Moraceae	50	WM	03	2	1	1	3	04	07	400.0	7/7	-10.0	4.1/ 4.1	100
	Lf St, AQ/EtOH	90	KB	16	5						Slope	-0.19	ED50	Ml.0 x 10(2)	
	Hengchun, 11/64														
B626471	Mucuna ferruginea Matsum.	02	LE	03	2	1	1	1	09	30	70.0	6/6	- 4.4	8.2/ 8.0	102
	Leguminosae	50	WA	03	2	1	1	3	04	07	140.0	6/7	- 8.0	5.7/ 9.5	60
	Lf St, AQ/EtOH	90	KB	16	5								ED50	Ml.0 x 10(2)	
	Liu-kuei, 01/67														
B603920	Murraya paniculata Jack.	02	LE	05	2	1	1	1	15	Z	400.0	6/6	- 1.6	9.5/ 9.8	96
	Rutaceae	50	WM	05	2	1	1	3	04	07	400.0	6/6	- 2.0	4.4/ 8.5	51
	Lf St, AQ/EtOH	90	KB	16	5								ED50	Ml.0 x 10(2)	
	Hengchun, 1965														
B603921	Musa sp.	02	LE	05	2	1	1	1	15	Z	400.0	4/6	- 1.4	8.8/ 9.8	89
	Musaceae	50	WM	05	2	1	1	3	04	07	400.0	5/6	- 7.0	4.1/ 8.5	48
	Lf St, AQ/EtOH	90	KB	16	5						Slope	-0.66	ED50	7.6 x 10(1)	
	Hengchun, 1965														
B672016	Myriactis longipedunculata	02	LE	03	2	1	1	1	09	30	170.0	6/6	- 3.3	8.5/ 8.6	98
	Hay.	02	PS	03	2	1	1	1	10	30	170.0	6/6	- 4.4	10.0/ 9.0	111
	Compositae	90	KB	16	5								ED50	Ml.0 x 10(2)	
	Pl, AQ/EtOH														
	Mt. Ta-hsue, 01/67														
B603922	Myristica cagayanensis	02	LE	05	2	1	1	1	15	Z	400.0	6/6	- 1.7	8.8/ 9.8	89
	Merr.	50	WM	05	2	1	1	3	04	07	400.0	6/6	- 1.0	3.9/ 8.5	45
	Myristicaceae	90	KB	16	5								ED50	Ml.0 x 10(2)	
	Lf St, AQ/EtOH														
	Hengchun, 1965														

Table 2 *In Vitro* And *In Vivo* Data On Taiwan Plant Extracts

NSC NO.	BOTANICAL NAME	HOST	TEST SYS.	SCREENER	VEHICLE	ROUTE	DOSE REG.	DAY 1ST INJ.	NO. OF INJ.	DAY OF SAC.	DOSE	SURVIVORS	ANIMAL WT. DIFF.	TUMOR WT. OR SURVIVAL (T./C.)	PERCENT
B672772	Neolitsea acuminatissima	02	LE	05	2	1	1	1	09	30	400.0	6/6	- 1.5	10.0/ 9.8	102
	(Hay.) Kaneh. & Sasaki	02	PS	05	2	1	1	1	10	29	400.0	6/6	- 2.2	11.0/ 9.5	115
	Lauraceae	90	KB	16	5						Slope	-0.50	ED50	8.9 x 10(1)	
	Lf St, AQ/EtOH														
	Mt. Ta-hsue, 01/67														
B603924	Neonauclea reticulata Merr.	02	LE	05	2	1	1	1	15	Z	400.0	6/6	- 1.2	9.3/ 9.8	94
	Rubiaceae	50	WM	05	2	1	1	3	04	07	400.0	6/6	- 5.0	6.2/ 8.5	72
	Lf, AQ/EtOH	90	KB	16	2								ED50	M1.0 x 10(2)	
	Hengchun, 1965														
B672160	Nephelium lappaceum L.	06	LE	06	2	1	1	1	09	30	400.0	6/6	- 1.6	9.0/ 8.9	101
	Sapindaceae	06	PS	06	2	1	1	1	10	30	200.0	6/6	- 1.0	9.0/ 9.0	100
	Lf St, AQ/EtOH	90	KB	06	B								ED50	M1.0 x 10(2)	
	Mt. Ali, 01/67														
B672137	Nephelium litchi Camb.	02	LE	08	2	1	1	1	09	30	400.0	6/6	0.6	9.0/ 8.6	104
	Sapindaceae	02	PS	08	2	1	1	1	10	30	400.0	5/6	- 0.2	12.0/10.0	120
	Aril juice, Dialysable	90	KB	16	2								ED50	M1.0 x 10(2)	
	Taichung, 07/68														
B672138	Nephelium litchi Camb.	02	LE	08	2	1	1	1	09	30	400.0	6/6	0.2	9.3/ 8.8	105
	Sapindaceae	02	PS	08	2	1	1	1	10	30	400.0	6/6	- 0.3	11.0/10.0	110
	Aril juice, Non-dialysable	90	KB	16	2								ED50	M1.0 x 10(2)	
	Taichung, 07/68														
B672133	Nephelium litchi Camb.	02	LE	08	2	1	1	1	09	30	400.0	6/6	- 2.0	9.2/ 8.8	104
	Sapindaceae	02	PS	08	2	1	1	1	10	30	400.0	6/6	- 0.3	11.0/12.0	91
	Sd, AQ	90	KB	16	2								ED50	M1.0 x 10(2)	
	Taichung, 07/68														

Table 2 *In Vitro* And *In Vivo* Data On Taiwan Plant Extracts

NSC NO.	BOTANICAL NAME	HOST	TEST SYS.	SCREENER	VEHICLE	ROUTE	DOSE REG.	DAY 1ST INJ.	NO. OF INJ.	DAY OF SAC.	DOSE	SURVIVORS	ANIMAL WT. DIFF.	TUMOR WT. OR SURVIVAL (T./C.)	PERCENT
B672132	Nephelium litchi Camb.	02	LE	08	2	1	1	1	09	30	400.0	5/6	- 3.0	9.0/ 9.7	92
	Sapindaceae	02	PS	08	2	1	1	1	10	30	400.0	6/6	- 1.8	9.5/10.0	95
	Sd, AQ/EtOH	90	KB	16	F						Slope	-1.00	ED50	2.2 x 10(1)	
	Taichung, 07/68														
B672131	Nephelium litchi Camb.	02	LE	08	2	1	1	1	09	30	400.0	6/6	- 1.6	8.8/ 9.7	90
	Sapindaceae	02	PS	08	2	1	1	1	10	30	400.0	6/6	- 1.0	11.0/10.0	110
	Sd, EtOH	90	KB	16	2								ED50	M1.0 x 10(2)	
	Taichung, 07/68														
B672136	Nephelium litchi Camb.	02	LE	08	2	1	1	1	09	30	400.0	6/6	- 1.2	8.8/ 8.6	102
	Sapindaceae	02	PS	08	2	1	1	1	10	30	400.0	6/6	- 1.9	10.5/10.0	105
	Shell, AQ	90	KB	16	2								ED50	M1.0 x 10(2)	
	Taichung, 07/68														
B672135	Nephelium litchi Camb.	02	LE	08	2	1	1	1	09	30	400.0	6/6	- 1.9	9.5/ 8.6	110
	Sapindaceae	02	PS	08	2	1	1	1	10	30	200.0	6/6	- 0.3	11.5/12.0	95
	Shell, AQ/EtOH	90	KB	16	2								ED50	M1.0 x 10(2)	
	Taichung, 07/68														
B672134	Nephelium litchi Camb.	02	LE	08	2	1	1	1	09	30	400.0	6/6	- 0.9	8.7/ 8.6	101
	Sapindaceae	02	PS	08	2	1	1	1	10	30	400.0	6/6	- 1.2	11.5/10.0	115
	Shell, EtOH	90	KB	16	5								ED50	M1.0 x 10(2)	
	Taichung, 07/68														
B603763	Nephrolepis cordifolia	02	LE	05	2	1	1	1	Z	Z	500.0	6/6	- 1.7	9.0/ 9.1	98
	Presl	50	WM	05	2	1	1	3	04	07	500.0	6/6	- 4.0	4.6/ 9.7	47
	Polypodiaceae	90	KB	06	B								ED50	M1.0 x 10(2)	
	Pl, EtOH														
	Taipei, 1965														

Table 2 *In Vitro* And *In Vivo* Data On Taiwan Plant Extracts

NSC NO.	BOTANICAL NAME	HOST	TEST SYS.	SCREENER	VEHICLE	ROUTE	DOSE REG.	DAY 1ST INJ.	NO. OF INJ.	DAY OF SAC.	DOSE	SURVIVORS	ANIMAL WT. DIFF.	TUMOR WT. OR SURVIVAL (T./C.)	PERCENT
B626224	Oroxylum indicum Vent.	02	LE	03	8	1	1	1	15	Z	400.0	6/6	- 2.5	8.0/ 8.3	96
	Bignoniaceae	50	WM	03	8	1	1	3	04	07	400.0	6/6	2.0	9.0/14.5	62
	Lf St, AQ/EtOH	90	KB	16	5								ED50	Ml.0 x 10(2)	
	Hengchun, 11/64														
B603925	Oxalis sp.	02	LE	05	2	1	1	1	15	Z	25.0	6/6	- 0.4	9.7/ 9.7	100
	Oxalidaceae	50	WM	05	2	1	1	3	04	07	25.0	6/6	-15.0	6.4/ 8.5	75
	Lf St, AQ/EtOH	90	KB	16	5						Slope	-1.40	ED50	3.3 x 10(1)	
	Hengchun, 1965														
B672158	Paederia chinensis Hance	06	LE	06	2	1	1	1	09	30	400.0	6/6	- 0.5	8.7/ 8.9	97
	Rubiaceae	06	PS	06	2	1	1	1	10	30	200.0	6/6	- 1.5	8.0/ 9.0	88
	Pl, AQ/EtOH	90	KB	06	B								ED50	Ml.0 x 10(2)	
	Liu-kuei, 01/67														
B603926	Palaquium formosanum Hay.	02	LE	05	2	1	1	1	15	Z	200.0	6/6	- 1.4	9.0/ 9.7	92
	Sapotaceae	50	WM	05	2	1	1	3	04	07	400.0	5/6	- 9.0	4.8/ 8.5	56
	Lf St, AQ/EtOH	90	KB	16	2						Slope	-0.73	ED50	9.7 x 10(1)	
	Hengchun, 1965														
B603927	Pandanus boninensis Warb.	02	LE	05	2	1	1	1	15	Z	400.0	6/6	- 0.5	9.7/ 9.8	98
	Pandanaceae	50	WM	05	2	1	1	3	04	07	400.0	6/6	- 2.0	6.6/ 8.5	77
	Lf, AQ/EtOH	90	KB	16	2								ED50	Ml.0 x 10(2)	
	Hengchun, 1965														
B626261	Pandanus boninensis Warb.	02	LE	03	2	1	1	1	15	Z	400.0	6/6	- 0.4	8.5/ 8.7	97
	Pandanaceae	50	WM	03	2	1	1	3	04	07	400.0	7/7	- 4.0	2.9/ 4.1	70
	Lf St, AQ/EtOH	90	KB	16	5								ED50	Ml.0 x 10(2)	
	Hengchun, 11/64														

Table 2 *In Vitro* And *In Vivo* Data On Taiwan Plant Extracts

NSC NO.	BOTANICAL NAME	HOST	TEST SYS.	SCREENER	VEHICLE	ROUTE	DOSE REG.	DAY 1ST INJ.	NO. OF INJ.	DAY OF SAC.	DOSE	SURVIVORS	ANIMAL WT. DIFF.	TUMOR WT. OR SURVIVAL (T./C.)	PERCENT
B672887	Pandanus veitchi Hort.	02	LE	02	2	1	1	1	09	30	400.0	6/6	- 0.3	8.7/ 8.4	103
	Pandanaceae	02	PS	02	2	1	1	1	09	30	50.0	6/6	- 3.1	10.5/11.0	95
	Lf St, AQ/EtOH	90	KB	16	2								ED50	M1.0 x 10(2)	
	Hengchun, 11/65														
B603928	Parkia javanica Merr.	02	LE	05	2	1	1	1	15	Z	400.0	6/6	- 1.1	10.0/ 9.8	102
	Leguminosae	50	WM	05	2	1	1	3	04	07	400.0	6/6	- 9.0	5.6/ 8.5	65
	Lf St, AQ/EtOH	90	KB	16	5								ED50	M1.0 x 10(2)	
	Hengchun, 1965														
B672056	Pasania kodaihoensis	02	LE	03	2	1	1	1	09	30	100.0	6/6	- 2.6	8.7/ 8.6	101
	(Hay.) H. L. Li.	02	PS	03	2	1	1	1	10	30	200.0	5/6	- 3.6	9.6/10.1	95
	Fagaceae	90	KB	16	2						Slope	-1.23	ED50	3.0 x 10(1)	
	Lf St, AQ/EtOH														
	Liu-kuei, 11/66														
B672057	Pasania konishii	02	LE	03	2	1	1	1	09	30	100.0	5/6	- 1.8	8.8/ 8.8	100
	(Hay.) Schott.	02	PS	03	2	1	1	1	10	30	100.0	6/6	- 3.4	10.0/10.1	99
	Fagaceae	90	KB	16	F						Slope	-1.04	ED50	2.4 x 10(1)	
	Lf St, AQ/EtOH														
	Liu-kuei, 11/66														
B672833	Pasania uraiana	02	LE	02	2	1	1	1	09	30	400.0	6/6	- 3.8	8.3/ 8.7	95
	(Hay.) Schott.	02	PS	02	2	1	1	1	10	30	100.0	6/6	- 1.0	9.0/ 8.5	105
	Fagaceae	90	KB	16	5						Slope	-1.25	ED50	3.1 x 10(1)	
	Lf St, AQ/EtOH														
	Mt. Ch'i-hsing, 11/66														
B672849	Paulownia fortunei Hemsl.	02	LE	02	C	1	1	1	09	30	400.0	6/6	- 0.5	8.8/ 8.3	106
	Scrophulariaceae	02	PS	02	2	1	1	1	10	30	400.0	6/6	- 1.8	10.5/10.5	100
	Lf St, AQ/EtOH	90	KB	16	2								ED50	M1.0 x 10(2)	
	Mt. Ch'i-hsing, 11/66														

Table 2 *In Vitro* And *In Vivo* Data On Taiwan Plant Extracts

NSC NO.	BOTANICAL NAME	HOST	TEST SYS.	SCREENER	VEHICLE	ROUTE	DOSE REG.	DAY 1ST INJ.	NO. OF INJ.	DAY OF SAC.	DOSE	SURVIVORS	ANIMAL WT. DIFF.	TUMOR WT. OR SURVIVAL (T./C.)	PERCENT
B672754	Pedicularis transmorrisonensis Hay.	06	LE	06	2	1	1	1	09	30	400.0	6/6	- 1.3	9.0/ 9.0	100
		06	PS	06	2	1	1	1	10	30	400.0	6/6	- 3.0	9.0/ 9.0	100
	Scrophulariaceae	90	KB	06	B								ED50	M1.0 x 10(2)	
	Pl, AQ/EtOH														
	Mt. Ho-huan, 07/68														
B626227	Peltophorum inerme Naves	02	LE	03	2	1	1	1	15	Z	400.0	6/6	- 1.4	8.8/ 8.3	106
	Leguminosae	50	WM	03	2	1	1	3	04	07	400.0	7/7	6.0	8.8/10.5	83
	Lf St, AQ/EtOH	90	KB	16	5								ED50	M1.0 x 10(2)	
	Hengchun, 11/64														
B672069	Perilla frutescens Brit.	02	LE	08	2	1	1	1	09	30	200.0	6/6	- 1.3	8.7/ 9.7	89
	Labiatae	02	PS	08	2	1	1	1	10	30	400.0	6/6	- 1.2	10.0/11.0	90
	Pl, AQ/EtOH	90	KB	16	5						Slope	-0.94	ED50	2.2 x 10(1)	
	Chiayi, 11/66														
B672835	Phoebe formosana	02	LE	02	2	1	1	1	09	30	300.0	5/6	- 0.4	9.6/ 8.6	111
	(Hay.) Hay.	02	PS	02	2	1	1	1	10	30	150.0	6/6	- 1.4	12.0/11.0	109
	Lauraceae	90	KB	16	5						Slope	-1.09	ED50	2.6 x 10(1)	
	Lf St, AQ/EtOH														
	Mt. Ch'i-hsing, 11/66														
B603930	Photinia taiwanensis Hay.	02	LE	05	2	1	1	1	15	Z	400.0	6/6	- 1.0	9.3/ 9.8	94
	Rosaceae	50	WM	05	2	1	1	3	04	07	400.0	6/6	- 8.0	5.5/ 8.5	64
	Lf St, AQ/EtOH	90	KB	16	5						Slope	-0.98	ED50	3.5 x 10(1)	
	Hengchun, 1965														
B626240	Phyllanthus sp.	02	LE	03	8	1	1	1	15	Z	400.0	6/6	- 1.5	8.5/ 8.7	97
	Euphorbiaceae	50	WM	03	8	1	1	3	04	07	400.0	5/6	- 9.0	4.8/ 5.9	81
	Lf St, AQ/EtOH	90	KB	16	5						Slope	-0.47	ED50	7.4 x 10(1)	
	Hengchun, 11/64														

Table 2 *In Vitro* And *In Vivo* Data On Taiwan Plant Extracts

NSC NO.	BOTANICAL NAME	HOST	TEST SYS.	SCREENER	VEHICLE	ROUTE	DOSE REG.	DAY 1ST INJ.	NO. OF INJ.	DAY OF SAC.	DOSE	SURVIVORS	ANIMAL WT. DIFF.	TUMOR WT. OR SURVIVAL (T./C.)	PERCENT
B672106	Phyllanthus urinaria L.	02	LE	08	5	1	1	1	09	30	200.0	6/6	- 3.0	8.0/ 8.8	90
	Euphorbiaceae	02	PS	08	5	1	1	1	10	30	200.0	6/6	- 2.3	13.5/11.0	122
	Pl, AQ/EtOH	90	KB	16	5								ED50	M1.0 x 10(2)	
	Taichung, 11/65														
B603931	Phyllostachys makinoi Hay.	02	LE	05	2	1	1	1	15	Z	400.0	6/6	- 0.6	9.8/ 9.8	100
	Gramineae	50	WM	05	2	1	1	3	04	07	400.0	6/6	- 1.0	6.7/ 8.5	78
	Lf St, AQ/EtOH	90	KB	16	2								ED50	M1.0 x 10(2)	
	Hengchun, 1965														
B672878	Pilea trinervia Wight	02	LE	02	2	1	1	1	09	30	400.0	6/6	- 2.3	9.2/ 9.1	101
	Urticaceae	02	PS	02	2	1	1	1	10	30	400.0	6/6	- 1.2	13.0/12.0	108
	Lf St, AQ/EtOH	90	KB	16	E						Slope	-0.12	ED50	5.8 x 10(1)	
	Mt. Ch'i-hsing, 11/65														
B626262	Pinus massoniana Lamb.	02	LE	03	8	1	1	1	15	Z	200.0	5/6	- 2.0	8.6/ 8.7	98
	Pinaceae	50	WM	03	8	1	1	3	04	07	100.0	6/6	- 8.0	6.9/11.2	61
	Lf St, AQ/EtOH	90	KB	16	5						Slope	-0.92	ED50	2.2 x 10(1)	
	Hengchun, 11/64														
B672074	Pinus taiwanensis Hay.	02	LE	08	2	1	1	1	09	30	400.0	6/6	- 1.8	9.5/ 9.9	95
	Pinaceae	02	PS	08	2	1	1	1	10	30	400.0	6/6	- 2.1	12.0/11.0	109
	Lf St, AQ/EtOH	90	KB	16	2								ED50	M1.0 x 10(2)	
	Liu-kuei, 11/66														
B626317	Pinus taiwanensis Hay.	02	LE	08	Y	1	1	1	15	Z	400.0	5/6	- 3.8	8.8/ 7.6	115
	Pinaceae	50	WM	08	Y	1	1	3	04	07	400.0	4/6	- 2.0	4.1/ 8.6	47
	Pl, AQ/EtOH	90	KB	16	5						Slope	-1.10	ED50	2.5 x 10(1)	
	Mt. Ali, 01/67														

Table 2 *In Vitro* And *In Vivo* Data On Taiwan Plant Extracts

NSC NO.	BOTANICAL NAME	HOST	TEST SYS.	SCREENER	VEHICLE	ROUTE	DOSE REG.	DAY 1ST INJ.	NO. OF INJ.	DAY OF SAC.	DOSE	SURVIVORS	ANIMAL WT. DIFF.	TUMOR WT. OR SURVIVAL (T./C.)	PERCENT
B672779	Piper futokadsura	02	LE	05	2	1	1	1	09	30	400.0	6/6	- 1.6	9.0/ 9.8	91
	S. & Z.	02	PS	05	2	1	1	1	10	29	400.0	6/6	- 1.3	11.0/ 9.5	115
	Piperaceae	90	KB	16	5						Slope	-1.13	ED50	2.8 x 10(1)	
	Pl, AQ/EtOH														
	Chiayi, 11/66														
B626263	Pittosporum formosanum Hay.	02	LE	03	2	1	1	1	15	Z	20.0	6/6	- 1.7	9.0/ 8.7	103
	Pittosporaceae	50	WM	03	2	1	1	3	04	07	20.0	6/7	- 2.0	3.3/ 4.1	80
	Lf St, AQ/EtOH	90	KB	16	5						Slope	-0.12	ED50	M1.0 x 10(2)	
	Hengchun, 11/64														
B672805	Plagiogyria euphlebia	02	LE	06	2	1	1	1	09	30	400.0	6/6	- 2.3	8.3/ 9.4	88
	(Kuntze) Mett.	02	PS	06	2	1	1	1	10	30	50.0	6/6	- 0.6	10.0/11.0	90
	Polypodiaceae	90	KB	06	9								ED50	M1.0 x 10(2)	
	Pl, AQ/EtOH														
	Mt. Ta-hsue, 01/67														
B626248	Pleomele angustifolia	02	LE	03	8	1	1	1	15	Z	400.0	6/6	- 3.0	8.8/ 8.7	101
	N. E. Brown	50	WA	03	8	1	1	3	04	07	400.0	7/7	0.0	5.5/12.0	45
	Liliaceae	06	PS	06	8	1	1	1	09	30	200.0	6/6	- 4.5	10.5/11.0	95
	Lf St, AQ/EtOH	90	KB	16	5						Slope	-0.79	ED50	4.1 x 10(1)	
	Hengchun, 11/64														
B672111	Plumbago zeylanica L.	02	LE	08	2	1	1	1	09	30	400.0	6/6	- 2.9	9.2/ 9.4	97
	Plumbaginaceae	02	PS	08	2	1	1	1	10	30	400.0	6/6	- 2.7	12.0/11.0	109
	Pl, AQ/EtOH	90	KB	16	5								ED50	M1.0 x 10(2)	
	Hengchun, 11/65														
B672008	Poa annua L.	02	LE	03	2	1	1	1	09	30	200.0	6/6	- 1.6	8.7/ 8.9	97
	Gramineae	02	PS	03	2	1	1	1	10	30	200.0	6/6	- 1.7	9.8/ 9.1	107
	Lf St, AQ/EtOH	90	KB	16	5								ED50	M1.0 x 10(2)	
	Mt. Ta-hsue, 01/67														

Table 2 *In Vitro* And *In Vivo* Data On Taiwan Plant Extracts

NSC NO.	BOTANICAL NAME	HOST	TEST SYS.	SCREENER	VEHICLE	ROUTE	DOSE REG.	DAY 1ST INJ.	NO. OF INJ.	DAY OF SAC.	DOSE	SURVIVORS	ANIMAL WT. DIFF.	TUMOR WT. OR SURVIVAL (T./C.)	PERCENT
B626264	Podocarpus macrophylla	02	LE	03	2	1	1	1	15	Z	170.0	6/6	- 0.9	9.5/ 8.7	109
	D. Don.	50	WM	03	2	1	1	3	04	07	170.0	7/7	- 5.0	3.5/ 4.1	85
	Podocarpaceae	90	KB	16	5						Slope	-0.31	ED50	4.7 x 10(1)	
	Lf St, AQ/EtOH														
	Hengchun, 11/64														
B672064	Pogonatherum paniceum	02	LE	03	2	1	1	1	09	30	100.0	6/6	- 0.3	9.5/ 9.4	101
	(Lam.) Hack.	02	PS	03	2	1	1	1	10	30	100.0	6/6	- 1.1	11.5/ 9.9	116
	Gramineae	90	KB	16	F						Slope	-1.03	ED50	2.4 x 10(1)	
	Pl, AQ/EtOH														
	Liu-kuei, 11/66														
B672154	Polygonum barbatum L.	06	LE	06	2	1	1	1	09	30	400.0	6/6	- 2.3	9.2/ 8.9	103
	Polygonaceae	06	PS	06	2	1	1	1	10	30	200.0	6/6	- 2.0	9.0/ 9.0	100
	Pl, AQ/EtOH	90	KB	06	B						Slope	-1.03	ED50	2.4 x 10(1)	
	Mt. Ta-hsue, 01/67														
B672048	Polygonum caespitosum Bl.	02	LE	03	2	1	1	1	09	30	200.0	6/6	- 0.8	9.0/ 8.8	102
	Polygonaceae	02	PS	03	2	1	1	1	10	30	200.0	6/6	- 1.4	9.3/10.1	92
	Pl, AQ/EtOH	90	KB	16	F						Slope	-1.17	ED50	2.8 x 10(1)	
	Mt. Ta-hsue, 11/66														
B672192	Polygonum chinense L.	02	LE	06	2	1	1	1	09	30	400.0	5/6	- 3.2	8.4/ 9.4	89
	Polygonaceae	02	PS	06	2	1	1	1	10	30	200.0	6/6	- 1.7	10.0/ 9.0	111
	Pl, AQ/EtOH	90	KB	06	B								ED50	M1.0 x 10(2)	
	Mt. Ho-huan, 07/68														
B626266	Polygonum hydropiper L.	02	LE	03	8	1	1	1	15	Z	400.0	6/6	- 1.8	9.0/ 8.7	103
	Polygonaceae	50	WM	03	8	1	1	3	04	07	400.0	7/7	- 8.0	3.8/ 3.8	100
	Pl Fl, AQ/EtOH	90	KB	16	5						Slope	-0.23	ED50	M1.0 x 10(2)	
	Hengchun, 11/64														

Table 2 *In Vitro* And *In Vivo* Data On Taiwan Plant Extracts

NSC NO.	BOTANICAL NAME	HOST	TEST SYS.	SCREENER	VEHICLE	ROUTE	DOSE REG.	DAY 1ST INJ.	NO. OF INJ.	DAY OF SAC.	DOSE	SURVIVORS	ANIMAL WT. DIFF.	TUMOR WT. OR SURVIVAL (T./C.)	PERCENT
B672009	Polygonum lapathifolium L.	02	LE	03	2	1	1	1	09	30	200.0	6/6	- 3.8	9.2/ 8.6	106
	Polygonaceae	02	PS	03	2	1	1	1	10	30	200.0	5/6	- 3.8	9.4/ 9.0	104
	Pl, AQ/EtOH	90	KB	16	5								ED50	Ml.0 x 10(2)	
	Chiayi, 01/67														
B672193	Polygonum morrisonensis	06	LE	06	2	1	1	1	09	30	75.0	6/6	- 1.3	8.8/ 9.0	97
	Hay.	06	PS	06	2	1	1	1	10	30	150.0	6/6	- 3.2	9.0/ 9.0	100
	Polygonaceae	90	KB	06	B								ED50	Ml.0 x 10(2)	
	Pl, AQ/EtOH														
	Mt. Ho-huan, 07/66														
B672155	Polygonum senticosum	06	LE	06	2	1	1	1	09	30	400.0	4/6	- 3.0	8.3/ 8.9	93
	Fr. & Sav.	06	PS	06	2	1	1	1	10	30	100.0	6/6	- 1.0	9.0/ 9.0	100
	Polygonaceae	90	KB	06	B						Slope	-0.25	ED50	Ml.0 x 10(2)	
	Pl, AQ/EtOH														
	Liu-kuei, 01/67														
B672199	Potentilla leuconota Don	02	LE	06	2	1	1	1	09	30	75.0	6/6	1.8	9.0/ 9.4	95
	var. morrisonicola Hay.	02	PS	06	2	1	1	1	10	30	75.0	6/6	- 2.4	7.0/ 7.0	100
	Rosaceae	90	KB	06	B						Slope	-0.64	ED50	8.3 x 10(1)	
	Pl, AQ/EtOH														
	Mt. Ho-huan, 07/68														
B672758	Pothos seemanni Schott.	02	LE	05	2	1	1	1	09	30	100.0	6/6	- 4.1	9.5/ 8.6	110
	Araceae	02	PS	05	2	1	1	1	10	30	100.0	6/6	- 2.8	10.0/10.0	100
	Lf St, AQ/EtOH	90	KB	16	2						Slope	-0.75	ED50	5.1 x 10(1)	
	Liu-kuei, 11/66														
B626274	Premna odorata Blanco	02	LE	03	8	1	1	1	15	Z	400.0	6/6	- 0.1	7.8/ 8.0	97
	Verbenaceae	50	WM	03	8	1	1	3	04	07	400.0	7/7	- 9.0	7.4/10.9	67
	Lf St, AQ/EtOH	90	KB	16	5								ED50	Ml.0 x 10(2)	
	Hengchun, 11/64														

Table 2 *In Vitro* And *In Vivo* Data On Taiwan Plant Extracts

NSC NO.	BOTANICAL NAME	HOST	TEST SYS.	SCREENER	VEHICLE	ROUTE	DOSE REG.	DAY 1ST INJ.	NO. OF INJ.	DAY OF SAC.	DOSE	SURVIVORS	ANIMAL WT. DIFF.	TUMOR WT. OR SURVIVAL (T./C.)	PERCENT
B672195	Primula miyabeana	02	LE	06	2	1	1	1	09	30	400.0	6/6	- 2.8	8.2/ 9.4	87
	Ito & Kawak.	02	PS	06	2	1	1	1	10	30	200.0	6/6	- 1.9	7.5/ 8.0	93
	Primulaceae	90	KB	06	B								ED50	M1.0 x 10(2)	
	Pl, AQ/EtOH														
	Mt. Ho-huan, 07/68														
B672001	Prinsepia scandens Hay.	02	LE	03	8	1	1	1	09	30	400.0	6/6	- 0.4	8.8/ 8.9	98
	Rosaceae	02	PS	03	8	1	1	1	10	30	400.0	6/6	- 2.4	10.5/ 9.6	109
	Lf St, AQ/EtOH	90	KB	16	5								ED50	M1.0 x 10(2)	
	Mt. Ta-hsue, 01/67														
B672157	Prunus mume Sieb. & Zucc.	06	LE	06	2	1	1	1	09	30	400.0	6/6	- 2.4	9.0/ 8.9	101
	Rosaceae	06	PS	06	2	1	1	1	10	30	200.0	6/6	- 1.8	9.0/ 9.0	100
	Lf St, AQ/EtOH	90	KB	06	B								ED50	M1.0 x 10(2)	
	Mt. Ta-hsue, 01/67														
B672086	Psidium littorale Radd.	02	LE	08	2	1	1	1	09	30	400.0	6/6	- 1.4	10.7/ 9.9	108
	Myrtaceae	02	PS	08	2	1	1	1	10	30	400.0	6/6	- 2.0	12.0/11.0	109
	Lf St, AQ/EtOH	90	KB	16	5						Slope	-0.27	ED50	4.3 x 10(1)	
	Hengchun, 11/65														
B672844	Pteris fauriei Hieron	02	LE	02	2	1	1	1	09	30	300.0	5/6	- 2.7	9.4/ 8.7	108
	Polypodiaceae	02	PS	02	2	1	1	1	10	30	300.0	6/6	- 3.8	11.0/12.0	91
	Pl, AQ/EtOH	90	KB	16	5						Slope	-1.04	ED50	2.4 x 10(1)	
	Liu-kuei, 11/66														
B672096	Pteris vittata L.	02	LE	08	2	1	1	1	09	30	200.0	6/6	- 2.7	9.0/ 8.6	104
	Polypodiaceae	02	PS	08	9	1	1	1	10	30	100.0	6/6	- 0.4	12.5/12.0	104
	Pl, AQ/EtOH	90	KB	16	5						Slope	-0.71	ED50	5.1 x 10(1)	
	Chiayi, 11/66														

Table 2 *In Vitro* And *In Vivo* Data On Taiwan Plant Extracts

NSC NO.	BOTANICAL NAME	HOST	TEST SYS.	SCREENER	VEHICLE	ROUTE	DOSE REG.	DAY 1ST INJ.	NO. OF INJ.	DAY OF SAC.	DOSE	SURVIVORS	ANIMAL WT. DIFF.	TUMOR WT. OR SURVIVAL (T./C.)	PERCENT
B603933	Pterocarpus santalinus L.	02	LE	05	2	1	1	1	15	Z	400.0	6/6	- 1.8	9.0/ 9.8	91
	Leguminosae	50	WM	05	2	1	1	3	04	07	400.0	5/6	- 9.0	3.8/ 8.5	44
	Lf, AQ/EtOH	90	KB	16	5						Slope	-0.59	ED50	9.1 x 10(1)	
	Hengchun, 1965														
B626316	Pueraria thunbergiana	02	LE	08	8	1	1	1	15	Z	400.0	5/6	- 4.3	8.0/ 7.6	105
	Benth.	50	WM	08	8	1	1	3	04	07	400.0	5/6	- 2.0	6.6/ 8.6	76
	Leguminosae	90	KB	16	5						Slope	-0.16	ED50	M1.0 x 10(2)	
	Lf St, AQ/EtOH														
	Hengchun, 11/65														
B672773	Pueraria tonkinensis Gagn.	02	LE	05	2	1	1	1	09	30	400.0	6/6	- 1.1	9.7/ 9.8	98
	Leguminosae	02	PS	05	2	1	1	1	10	29	400.0	6/6	- 2.3	11.0/ 9.5	115
	Lf St, AQ/EtOH	90	KB	16	5								ED50	M1.0 x 10(2)	
	Chiayi, 11/66														
B672070	Pyrrosia lingua	02	LE	08	2	1	1	1	09	30	150.0	6/6	- 2.5	9.7/ 8.8	110
	(Thunb.) Farw.	02	PS	08	2	1	1	1	10	30	150.0	6/6	- 2.2	11.0/11.0	100
	Polypodiaceae	90	KB	16	5						Slope	-1.18	ED50	2.8 x 10(1)	
	Pl, AQ/EtOH														
	Liu-kuei, 11/66														
B626271	Randia sinensis	02	LE	03	8	1	1	1	15	Z	400.0	6/6	- 0.9	9.3/ 8.7	106
	Roem. & Schult.	50	WM	03	8	1	1	3	04	07	400.0	6/7	- 8.0	2.6/ 3.8	68
	Rubiaceae	90	KB	16	5						Slope	-0.54	ED50	4.2 x 10(1)	
	Lf St, AQ/EtOH														
	Hengchun, 11/64														
B603935	Raphiolepis indica Lindl.	02	LE	05	2	1	1	1	15	Z	50.0	6/6	0.4	9.2/ 9.7	94
	var. tashiroi Hay.	50	WM	05	2	1	1	3	04	07	50.0	6/6	- 3.0	7.3/ 8.5	85
	Rosaceae	90	KB	16	5						Slope	-1.10	ED50	3.6 x 10(1)	
	Lf St, AQ/EtOH														
	Hengchun, 1965														

Table 2 *In Vitro* And *In Vivo* Data On Taiwan Plant Extracts

NSC NO.	BOTANICAL NAME	HOST	TEST SYS.	SCREENER	VEHICLE	ROUTE	DOSE REG.	DAY 1ST INJ.	NO. OF INJ.	DAY OF SAC.	DOSE	SURVIVORS	ANIMAL WT. DIFF.	TUMOR WT. OR SURVIVAL (T./C.)	PERCENT
B626289	Rauwolfia verticillata	02	LE	08	8	1	1	1	15	Z	400.0	6/6	- 4.1	8.5/ 7.6	111
	Baill.	50	WM	08	8	1	1	3	04	07	400.0	6/7	- 5.0	3.2/ 6.7	47
	Apocynaceae	90	KB	16	5						Slope	-0.17	ED50	Ml.0 x 10(2)	
	Lf St, AQ/EtOH														
	Hengchun, 11/65														
B603936	Reevesia formosana Hay.	02	LE	05	2	1	1	1	15	Z	400.0	6/6	- 1.3	9.5/ 9.8	96
	Sterculiaceae	50	WM	05	2	1	1	3	04	07	400.0	6/6	- 3.0	6.0/ 8.5	70
	Lf St, AQ/EtOH	90	KB	16	5						Slope	-1.40	ED50	3.6 x 10(1)	
	Hengchun, 1965														
B672156	Rhamnus davurica Pall.	06	LE	06	2	1	1	1	09	30	400.0	6/6	- 0.6	8.8/ 8.9	98
	Rhamnaceae	06	PS	06	2	1	1	1	10	30	400.0	6/6	- 1.3	11.0/11.0	100
	Lf St, AQ/EtOH	90	KB	06	B								ED50	Ml.0 x 10(2)	
	Liu-kuei, 01/67														
B603937	Rhamnus formosana Matsum.	02	LE	05	2	1	1	1	15	Z	400.0	6/6	0.2	9.7/ 9.8	98
	Rhamnaceae	50	WM	05	2	1	1	3	04	07	400.0	6/6	- 4.0	7.5/ 8.5	88
	Lf St, AQ/EtOH	90	KB	16	5								ED50	Ml.0 x 10(2)	
	Hengchun, 1965														
B672175	Rhododendron chrysanthum	02	LE	06	2	1	1	1	09	30	37.5	6/6	- 0.8	9.3/ 9.1	102
	Hay.	06	PS	06	2	1	1	1	10	30	75.0	4/6	- 2.4	9.0/ 9.0	100
	Ericaceae	90	KB	06	B						Slope	-0.96	ED50	2.0 x 10(1)	
	Px, AQ/EtOH														
	Mt. Ho-huan, 07/68														
B672901	Rhododendron ellipticum	02	LE	02	2	1	1	1	09	30	100.0	6/6	- 1.8	9.7/ 8.9	108
	Maxim.	02	PS	02	2	1	1	1	10	30	50.0	6/6	- 2.6	12.5/11.0	113
	Ericaceae	90	KB	16	5						Slope	-1.11	ED50	2.7 x 10(1)	
	Lf St, AQ/EtOH														
	Mt. Ch'i-hsing, 11/66														

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NSC NO.	BOTANICAL NAME	HOST	TEST SYS.	SCREENER	VEHICLE	ROUTE	DOSE REG.	DAY 1ST INJ.	NO. OF INJ.	DAY OF SAC.	DOSE	SURVIVORS	ANIMAL WT. DIFF.	TUMOR WT. OR SURVIVAL (T./C.)	PERCENT
B672041	Rhododendron formosanum	02	LE	03	8	1	1	1	09	30	200.0	6/6	0	8.5/ 8.8	96
	Hemsl.	02	PS	03	8	1	1	1	10	30	200.0	6/6	- 2.2	10.3/ 9.1	113
	Ericaceae	90	KB	16	F						Slope	-1.16	ED50	2.8 x 10(1)	
	Lf St, AQ/EtOH														
	Mt. Ta-hsue, 11/66														
B672767	Rhododendron morii Hay.	02	LE	05	2	1	1	1	09	30	100.0	6/6	- 0.7	9.8/ 9.7	101
	Ericaceae	02	PS	05	2	1	1	1	10	29	100.0	6/6	- 0.9	10.0/ 9.5	105
	Pl, AQ/EtOH	90	KB	16	5						Slope	-1.24	ED50	3.1 x 10(1)	
	Mt. Ali, 11/66														
B672836	Rhododendron rubropunctatum	02	LE	02	2	1	1	1	09	30	400.0	4/6	- 4.4	10.0/ 9.1	109
	Hay.	02	PS	02	C	1	1	1	10	30	100.0	6/6	- 0.2	12.0/11.0	109
	Ericaceae	90	KB	16	5						Slope	-0.94	ED50	2.2 x 10(1)	
	Pl, AQ/EtOH														
	Mt. Ta-hsue, 01/67														
B626287	Rhus ambigua Lav.	02	LE	08	8	1	1	1	15	Z	200.0	4/6	- 3.7	7.8/ 8.8	88
	Anacardiaceae	50	WM	08	Y	1	1	3	04	07	200.0	6/6	- 7.0	6.2/ 7.3	84
	Pl, AQ/EtOH	90	KB	16	5						Slope	-0.95	ED50	2.1 x 10(1)	
	Mt. Ali, 12/66														
B603938	Rhus semialata Murr.	02	LE	05	2	1	1	1	15	Z	400.0	6/6	- 1.7	10.7/ 9.8	109
	var. roxburgii DC.	50	WM	05	2	1	1	3	04	07	400.0	6/6	- 6.0	8.1/ 8.5	95
	Anacardiaceae	90	KB	16	5								ED50	M1.0 x 10(2)	
	Lf St, AQ/EtOH														
	Hengchun, 1965														
B603939	Rhus succedanea L.	02	LE	05	2	1	1	1	15	Z	400.0	6/6	- 1.1	9.2/ 9.8	93
	var. dumoutieri K. & M.	50	WM	05	2	1	1	3	04	07	400.0	6/6	- 5.0	6.8/ 8.5	80
	Anacardiaceae	90	KB	16	5								ED50	M1.0 x 10(2)	
	Lf St, AQ/EtOH														
	Hengchun, 1965														

Table 2 *In Vitro* And *In Vivo* Data On Taiwan Plant Extracts

NSC NO.	BOTANICAL NAME	HOST	TEST SYS.	SCREENER	VEHICLE	ROUTE	DOSE REG.	DAY 1ST INJ.	NO. OF INJ.	DAY OF SAC.	DOSE	SURVIVORS	ANIMAL WT. DIFF.	TUMOR WT. OR SURVIVAL (T./C.)	PERCENT
B672753	Ribes formosanum Hay.	02	LE	06	2	1	1	1	09	30	100.0	5/6	0.0	8.8/ 9.4	93
	Saxifragaceae	02	PS	06	2	1	1	1	10	30	100.0	6/6	- 1.2	8.0/ 7.0	114
	Lf St, AQ/EtOH	90	KB	06	B						Slope	-0.38	ED50	M1.0 x 10(2)	
	Mt. Ho-huan, 07/68														
B672102	Roripa indica Hieron.	02	LE	08	2	1	1	1	09	30	400.0	6/6	- 1.1	9.5/ 9.9	95
	Cruciferae	02	PS	08	2	1	1	1	10	30	400.0	6/6	- 0.9	13.5/11.0	122
	Lf St, AQ/EtOH	90	KB	16	5						Slope	-0.49	ED50	5.3 x 10(1)	
	Chiayi, 11/66														
B672848	Rubus buergeri	02	LE	02	2	1	1	1	09	30	150.0	6/6	- 1.7	9.2/ 8.7	105
	(Miquel.) Miq.	02	PS	02	2	1	1	1	10	30	150.0	5/6	- 3.2	11.0/12.0	91
	Rosaceae	90	KB	16	5						Slope	-1.35	ED50	3.3 x 10(1)	
	Lf St, AQ/EtOH														
	Mt. Ch'i-hsing, 11/66														
B672049	Rubus calycinoides Hay.	02	LE	03	8	1	1	1	09	30	200.0	6/6	- 1.3	8.7/ 8.8	98
	Rosaceae	02	PS	03	8	1	1	1	10	30	200.0	6/6	- 0.8	10.2/10.1	100
	Lf St, AQ/EtOH	90	KB	16	F						Slope	-1.15	ED50	2.7 x 10(1)	
	Mt. Ta-hsue, 11/66														
B672200	Rubus calycinoides Hay.	06	LE	06	2	1	1	1	09	30	50.0	6/6	- 1.6	9.2/ 8.7	105
	Rosaceae	02	PS	06	2	1	1	1	10	30	200.0	5/6	- 2.2	8.0/ 7.0	114
	Pl, AQ/EtOH	90	KB	06	B								ED50	M1.0 x 10(2)	
	Mt. Ho-huan, 07/66														
B626319	Rubus formosensis O. K.	02	LE	08	8	1	1	1	15	Z	400.0	6/6	- 4.2	8.0/ 7.6	105
	Rosaceae	50	WM	08	Y	1	1	3	04	07	400.0	5/6	- 4.0	4.7/ 8.6	54
	Pl, AQ/EtOH	90	KB	16	5						Slope	-1.00	ED50	2.6 x 10(1)	
	Mt. Ali, 01/67														

Table 2 *In Vitro* And *In Vivo* Data On Taiwan Plant Extracts

NSC NO.	BOTANICAL NAME	HOST	TEST SYS.	SCREENER	VEHICLE	ROUTE	DOSE REG.	DAY 1ST INJ.	NO. OF INJ.	DAY OF SAC.	DOSE	SURVIVORS	ANIMAL WT. DIFF.	TUMOR WT. OR SURVIVAL (T./C.)	PERCENT
B672099	Rubus fraxinifoliolus Hay.	02	LE	08	2	1	1	1	09	30	300.0	6/6	- 3.5	9.0/ 9.7	92
	Rosaceae	02	PS	08	2	1	1	1	10	30	150.0	5/6	- 1.0	11.0/11.0	100
	Lf St, AQ/EtOH	90	KB	16	5								ED50	M1.0 x 10(2)	
	Chiayi, 11/66														
B672781	Rubus kawakamii Hay.	02	LE	05	2	1	1	1	09	30	100.0	6/6	0.1	9.5/ 9.7	97
	Rosaceae	02	PS	05	2	1	1	1	10	29	100.0	6/6	- 2.1	11.0/ 9.5	115
	Pl, AQ/EtOH	90	KB	16	5						Slope	-1.14	ED50	2.8 x 10(1)	
	Mt. Ta-hsue, 01/67														
B672002	Rubus pectinellus Maxim.	02	LE	03	8	1	1	1	09	30	50.0	6/6	- 1.7	8.2/ 8.7	94
	var. trilobus koidz.	02	PS	03	8	1	1	1	10	30	100.0	6/6	- 2.9	8.5/ 9.7	87
	Rosaceae	90	KB	16	5						Slope	-0.28	ED50	M1.0 x 10(2)	
	Lf St, AQ/EtOH														
	Mt. Ta-hsue, 01/67														
B626270	Rubus taiwanianus Matsum.	02	LE	03	8	1	1	1	15	Z	400.0	6/6	- 1.7	9.2/ 8.7	105
	Rosaceae	50	WM	03	8	1	1	3	04	07	400.0	7/7	- 9.0	3.1/ 3.8	81
	Lf St, AQ/EtOH	90	KB	16	5						Slope	-0.19	ED50	M1.0 x 10(2)	
	Hengchun, 11/64														
B672014	Rubus tricanthus Focke	02	LE	03	2	1	1	1	09	30	150.0	6/6	- 2.9	8.5/ 8.6	98
	Rosaceae	02	PS	03	2	1	1	1	10	30	75.0	6/6	- 1.5	10.5/10.1	103
	Pl, AQ/EtOH	90	KB	16	5								ED50	M1.0 x 10(2)	
	Mt. Ta-hsue, 01/67														
B626259	Sabal adansoni Guers.	02	LE	03	2	1	1	1	15	Z	400.0	6/6	- 3.3	8.5/ 8.7	97
	Palmae	50	WM	03	2	1	1	3	04	07	400.0	6/7	- 5.0	2.8/ 4.1	68
	Lf St, AQ/EtOH	90	KB	16	5								ED50	M1.0 x 10(2)	
	Hengchun, 11/64														

Table 2 *In Vitro* And *In Vivo* Data On Taiwan Plant Extracts

NSC NO.	BOTANICAL NAME	HOST	TEST SYS.	SCREENER	VEHICLE	ROUTE	DOSE REG.	DAY 1ST INJ.	NO. OF INJ.	DAY OF SAC.	DOSE	SURVIVORS	ANIMAL WT. DIFF.	TUMOR WT. OR SURVIVAL (T./C.)	PERCENT
B672060	Saccharum sinensis Roxb.	02	LE	03	2	1	1	1	09	30	200.0	6/6	0.9	8.5/ 8.8	96
	Gramineae	02	PS	03	2	1	1	1	10	30	200.0	6/6	0.4	9.4/10.1	96
	F1, AQ/EtOH	90	KB	16	2								ED50	Ml.0 x 10(2)	
	Tainan, 11/66														
B672876	Sageretia theezans Brongn.	02	LE	02	2	1	1	1	09	30	100.0	6/6	- 0.7	10.8/ 9.9	109
	Rhamnaceae	02	PS	02	2	1	1	1	10	30	100.0	6/6	- 0.1	11.5/11.0	104
	Lf St, AQ/EtOH	90	KB	16	5								ED50	Ml.0 x 10(2)	
	Hengchun, 11/65														
B672183	Salvia hayatana Makino	02	LE	06	2	1	1	1	09	30	400.0	6/6	- 1.3	9.0/ 9.4	95
	Labiatae	02	PS	06	2	1	1	1	10	30	400.0	6/6	- 0.6	11.0/11.0	100
	Pl, AQ/EtOH	90	KB	06	B						Slope	-0.42	ED50	Ml.0 x 10(2)	
	Mt. Ho-huan, 07/68														
B603940	Samanea saman Merr.	02	LE	05	2	1	1	1	15	Z	200.0	6/6	- 0.9	9.8/ 9.7	101
	Leguminosae	50	WM	05	2	1	1	3	04	07	200.0	6/6	0	4.4/ 7.1	61
	Lf St, AQ/EtOH	90	KB	16	5						Slope	-0.44	ED50	Ml.0 x 10(2)	
	Hengchun, 1965														
B672023	Sambucus formosana Nakai	02	LE	03	2	1	1	1	09	30	300.0	6/6	- 1.3	9.0/ 8.7	103
	Caprifoliaceae	02	PS	03	2	1	1	1	10	30	300.0	6/6	- 2.6	10.0/ 9.6	104
	Lf St, AQ/EtOH	90	KB	16	5								ED50	Ml.0 x 10(2)	
	Chiayi, 01/67														
B672856	Sansevieria zeylanica Willd.	02	LE	02	C	1	1	1	09	30	400.0	6/6	- 2.8	9.2/ 9.1	101
		02	PS	02	2	1	1	1	10	30	400.0	6/6	- 2.6	9.5/ 9.0	105
	Liliaceae	90	KB	16	2								ED50	Ml.0 x 10(2)	
	Pl, AQ/EtOH														
	Hengchun, 11/65														

Table 2 *In Vitro* And *In Vivo* Data On Taiwan Plant Extracts

NSC NO.	BOTANICAL NAME	HOST	TEST SYS.	SCREENER	VEHICLE	ROUTE	DOSE REG.	DAY 1ST INJ.	NO. OF INJ.	DAY OF SAC.	DOSE	SURVIVORS	ANIMAL WT. DIFF.	TUMOR WT. OR SURVIVAL (T./C.)	PERCENT
B672066	Sapium discolor Muell. Arg.	02	LE	03	8	1	1	1	09	30	150.0	6/6	- 2.9	9.5/ 9.4	101
	Euphorbiaceae	02	PS	03	8	1	1	1	10	30	200.0	6/6	- 4.7	9.7/10.1	96
	Lf St, AQ/EtOH	90	KB	16	F						Slope	-1.15	ED50	2.5 x 10(1)	
	Hengchun, 11/66														
B603941	Sapium sebiferum Roxb.	02	LE	05	2	1	1	1	15	Z	100.0	6/6	- 0.2	8.7/ 9.7	89
	Euphorbiaceae	50	WM	05	2	1	1	3	04	07	200.0	6/6	- 7.0	4.2/ 7.1	59
	Lf St, AQ/EtOH	90	KB	16	5						Slope	-0.52	ED50	8.5 x 10(1)	
	Hengchun, 1965														
B672153	Sarcopyramis delicata	06	LE	06	2	1	1	1	09	30	37.5	5/6	- 1.8	8.6/ 9.0	95
	C. B. Rob.	02	PS	06	2	1	1	1	10	30	37.5	4/6	- 3.1	12.0/12.0	100
	Melastomataceae	90	KB	06	B								ED50	M1.0 x 10(2)	
	Lf St, AQ/EtOH														
	Mt. Ta-hsue, 11/66														
B626304	Scaevola frutescens Krause	02	LE	08	8	1	1	1	15	Z	400.0	6/6	- 1.3	7.7/ 7.6	101
	Goodeniaceae	50	WM	08	Y	1	1	3	04	07	400.0	6/6	2.0	5.9/ 8.7	67
	Lf St, AQ/EtOH	90	KB	16	5						Slope	-0.15	ED50	M1.0 x 10(2)	
	Hengchun, 11/65														
B672120	Schefflera arboricola Hay.	02	LE	08	2	1	1	1	09	30	150.0	4/6	- 2.4	8.3/ 8.8	94
	Araliaceae	02	PS	08	2	1	1	1	10	30	150.0	6/6	- 3.0	11.0/11.0	100
	Lf St, AQ/EtOH	90	KB	16	5								ED50	M1.0 x 10(2)	
	Hengchun, 11/65														
B603942	Schefflera octophylla	02	LE	05	2	1	1	1	15	Z	300.0	6/6	- 1.6	10.0/10.0	100
	Harms	50	WM	05	2	1	1	3	04	07	300.0	6/6	0	4.7/ 7.1	69
	Araliaceae	90	KB	16	5								ED50	M1.0 x 10(2)	
	Lf St, AQ/EtOH														
	Hengchun, 1965														

Table 2 *In Vitro* And *In Vivo* Data On Taiwan Plant Extracts

NSC NO.	BOTANICAL NAME	HOST	TEST SYS.	SCREENER	VEHICLE	ROUTE	DOSE REG.	DAY 1ST INJ.	NO. OF INJ.	DAY OF SAC.	DOSE	SURVIVORS	ANIMAL WT. DIFF.	TUMOR WT. OR SURVIVAL (T./C.)	PERCENT
B672760	Schefflera taiwaniana	02	LE	05	2	1	1	1	09	30	200.0	6/6	- 1.2	8.8/ 9.7	90
	(Nakai) Kanehira	02	PS	05	2	1	1	1	10	29	200.0	6/6	- 1.3	11.0/ 9.5	115
	Araliaceae	90	KB	16	2								ED50	M1.0 x 10(2)	
	Lf St, AQ/EtOH														
	Mt. Ali, 11/66														
B603943	Schizostachyum diffusum	02	LE	05	2	1	1	1	15	Z	400.0	4/6	- 1.3	10.3/10.0	103
	Merr.	50	WM	05	2	1	1	3	04	07	400.0	6/6	- 3.0	7.0/ 7.1	98
	Gramineae	90	KB	16	5								ED50	M1.0 x 10(2)	
	Lf St, AQ/EtOH														
	Hengchun, 1965														
B603944	Scolopia oldhami Hance	02	LE	05	2	1	1	1	15	Z	400.0	4/6	- 1.7	9.8/10.0	98
	Flacourtiaceae	50	WM	05	2	1	1	3	04	07	400.0	6/6	- 5.0	3.5/ 7.1	49
	Lf St, AQ/EtOH	90	KB	16	5						Slope	-0.60	ED50	5.9 x 10(1)	
	Hengchun, 1965														
B672798	Scurrula lonicerifolia	02	LE	06	2	1	1	1	09	30	400.0	5/6	- 2.9	7.8/ 8.5	91
	(Hay.) Dans.	02	PS	06	2	1	1	1	10	30	100.0	6/6	- 2.1	11.5/11.0	104
	Loranthaceae	90	KB	06	9						Slope	-0.98	ED50	3.5 x 10(1)	
	Pl, AQ/EtOH														
	Mt. Ta-hsue, 01/67														
B603945	Scurrula theifera Danser	02	LE	05	2	1	1	1	15	Z	400.0	5/6	- 0.7	10.6/10.0	106
	Loranthaceae	50	WM	05	2	1	1	3	04	07	400.0	6/6	0	5.6/ 7.1	78
	Lf St Fr, AQ/EtOH	90	KB	16	5						Slope	-1.20	ED50	3.6 x 10(1)	
	Hengchun, 1965														
B672061	Scutellaria rivularis Wall.	02	LE	03	8	1	1	1	09	30	400.0	6/6	0.3	8.7/ 8.8	98
	Labiatae	02	PS	03	8	1	1	1	10	30	400.0	6/6	- 1.9	9.8/ 9.6	102
	Pl, AQ/EtOH	90	KB	16	F						Slope	-1.16	ED50	2.8 x 10(1)	
	Taichung, 11/66														

Table 2 *In Vitro* And *In Vivo* Data On Taiwan Plant Extracts

NSC NO.	BOTANICAL NAME	HOST	TEST SYS.	SCREENER	VEHICLE	ROUTE	DOSE REG.	DAY 1ST INJ.	NO. OF INJ.	DAY OF SAC.	DOSE	SURVIVORS	ANIMAL WT. DIFF.	TUMOR WT. OR SURVIVAL (T./C.)	PERCENT
B672830	Securinega suffruticosa	02	LE	02	2	1	1	1	09	30	100.0	6/6	- 3.6	10.0/ 8.7	114
	(Pallas) Rehd.	02	PS	02	2	1	1	1	10	30	100.0	6/6	- 3.6	12.0/11.0	109
	Euphorbiaceae	90	KB	16	5						Slope	-1.23	ED50	3.0 x 10(1)	
	Lf St, AQ/EtOH														
	Mt. Ta-hsue, 11/66														
B672161	Selaginella caulescens	06	LE	06	2	1	1	1	09	30	100.0	6/6	- 1.8	8.3/ 8.3	100
	Spring	06	PS	06	2	1	1	1	10	30	200.0	5/6	- 3.4	9.0/ 9.0	100
	Selaginellaceae	90	KB	06	B						Slope	-1.59	ED50	2.0 x 10(1)	
	Pl, AQ/EtOH														
	Liu-kuei, 01/67														
B626216	Semecarpus vernicifera	02	LE	03	8	1	1	1	15	Z	400.0	6/6	- 2.6	8.0/ 8.3	96
	Hay. & Kawak.	50	WM	03	8	1	1	3	04	07	400.0	6/6	0.0	7.9/12.0	65
	Anacardiaceae	90	KB	16	5						Slope	-0.93	ED50	2.1 x 10(1)	
	Lf St, AQ/EtOH														
	Hengchun, 11/64														
B626297	Senecio nemorensis L.	02	LE	08	8	1	1	1	15	Z	400.0	6/6	- 2.5	7.5/ 7.6	98
	Compositae	50	WM	08	8	1	1	3	04	07	400.0	5/6	3.0	7.4/ 8.7	85
	Pl, AQ/EtOH	90	KB	16	5								ED50	M1.0 x 10(2)	
	Mt. Ali, 01/67														
B672006	Senecio scandens Buch.-Ham.	02	LE	03	2	1	1	1	09	30	400.0	6/6	0	8.8/ 8.9	98
	Compositae	02	PS	03	2	1	1	1	10	30	400.0	6/6	- 1.2	9.7/ 9.0	107
	Pl, AQ/EtOH	90	KB	16	5								ED50	M1.0 x 10(2)	
	Mt. Ta-hsue, 01/67														
B672094	Sida mysorensis W. & A.	02	LE	08	2	1	1	1	09	30	400.0	5/6	- 3.5	9.0/ 8.8	102
	Malvaceae	02	PS	08	9	1	1	1	10	30	100.0	6/6	- 0.6	11.5/12.0	95
	Pl, AQ/EtOH	90	KB	16	5								ED50	M1.0 x 10(2)	
	Chiayi, 11/66														

Table 2 *In Vitro* And *In Vivo* Data On Taiwan Plant Extracts

NSC NO.	BOTANICAL NAME	HOST	TEST SYS.	SCREENER	VEHICLE	ROUTE	DOSE REG.	DAY 1ST INJ.	NO. OF INJ.	DAY OF SAC.	DOSE	SURVIVORS	ANIMAL WT. DIFF.	TUMOR WT. OR SURVIVAL (T./C.)	PERCENT
B626321	Sideroxylon ferrugineum	02	LE	08	8	1	1	1	15	Z	100.0	6/6	- 1.8	7.7/ 8.4	91
	Hook. & Arn.	50	WM	08	8	1	1	3	04	07	100.0	6/6	- 5.0	6.2/ 8.0	77
	Sapotaceae	90	KB	16	5						Slope	-0.55	ED50	2.6 x 10(1)	
	Lf St, AQ/EtOH														
	Hengchun, 11/65														
B626320	Skimmia reevesiana Fortune	02	LE	08	8	1	1	1	15	Z	400.0	6/6	- 1.7	7.8/ 8.2	95
	Rutaceae	50	WM	08	8	1	1	3	04	07	400.0	6/6	2.0	7.2/ 8.6	83
	Pl, AQ/EtOH	90	KB	16	5						Slope	-0.51	ED50	8.6 x 10(1)	
	Mt. Ali, 01/67														
B672837	Smilax elongato-umbellata	02	LE	02	2	1	1	1	09	30	400.0	5/6	- 1.8	9.4/ 8.7	108
	Hay.	02	PS	02	2	1	1	1	10	30	200.0	3/4	- 0.7	11.0/11.0	100
	Liliaceae	90	KB	16	2								ED50	Ml.0 x 10(2)	
	Pl, AQ/EtOH														
	Mt. Ta-hsue, 01/67														
B672871	Smilax menispermoidea	02	LE	02	2	1	1	1	09	30	400.0	5/6	- 3.1	9.2/ 9.1	101
	A. DC.	02	PS	02	2	1	1	1	10	30	400.0	4/6	- 3.8	14.3/12.0	120
	var. randaiensis T. Koyama	90	KB	16	5						Slope	-0.80	ED50	1.7 x 10(1)	
	Liliaceae														
	Lf St, AQ/EtOH														
	Mt. Ta-hsue, 01/67														
B672010	Smilax opaca (DC. A.) Nort.	02	LE	03	2	1	1	1	09	30	400.0	6/6	- 0.4	8.3/ 8.6	96
	Liliaceae	02	PS	03	2	1	1	1	10	30	400.0	6/6	- 2.1	10.3/ 9.0	114
	Pl, AQ/EtOH	90	KB	16	5								ED50	Ml.0 x 10(2)	
	Mt. Ta-hsue, 01/67														
B672139	Solanum hidetaroi Masm.	02	LE	08	2	1	1	1	09	30	400.0	6/6	- 1.0	7.8/ 8.8	88
	Solanaceae	02	PS	08	2	1	1	1	10	30	400.0	6/6	- 2.7	11.0/10.0	110
	Pl, AQ/EtOH	90	KB	16	2								ED50		
	Mt. Ta-hsue, 01/67														

Table 2 *In Vitro* And *In Vivo* Data On Taiwan Plant Extracts

NSC NO.	BOTANICAL NAME	HOST	TEST SYS.	SCREENER	VEHICLE	ROUTE	DOSE REG.	DAY 1ST INJ.	NO. OF INJ.	DAY OF SAC.	DOSE	SURVIVORS	ANIMAL WT. DIFF.	TUMOR WT. OR SURVIVAL (T./C.)	PERCENT
B672115	Solanum incanum L.	02	LE	08	2	1	1	1	09	30	400.0	5/6	- 2.2	9.2/ 9.4	97
	Solanaceae	02	PS	08	2	1	1	1	10	30	400.0	6/6	- 0.9	12.0/11.0	109
	Pl, AQ/EtOH	90	KB	16	5								ED50	M1.0 x 10(2)	
	Hengchun, 11/65														
B672140	Solanum torvum Sw.	02	LE	08	2	1	1	1	09	30	400.0	6/6	- 2.6	7.8/ 8.8	88
	Solanaceae	02	PS	08	2	1	1	1	10	30	400.0	6/6	- 2.4	11.0/10.0	110
	Pl, AQ/EtOH	90	KB	16	5								ED50	M1.0 x 10(2)	
	Mt. Ta-hsue, 01/67														
B672171	Solidago virga-aurea L.	06	LE	06	2	1	1	1	09	30	400.0	6/6	0.2	8.5/ 8.9	95
	Compositae	02	PS	06	2	1	1	1	10	30	400.0	6/6	0.5	11.0/12.0	91
	Pl, AQ/EtOH	90	KB	06	B								ED50	M1.0 x 10(2)	
	Mt. Ho-huan, 07/68														
B672859	Spathodea campanulata	02	LE	02	C	1	1	1	09	30	400.0	6/6	- 1.8	10.0/ 9.1	109
	Beauvois	02	PS	02	2	1	1	1	10	30	400.0	6/6	- 1.8	9.0/ 9.0	100
	Bignoniaceae	90	KB	16	5						Slope	-0.42	ED50	M1.0 x 10(2)	
	Lf St, AQ/EtOH														
	Hengchun, 11/65														
B672751	Spiraea morrisonicola Hay.	06	LE	06	2	1	1	1	09	30	400.0	5/6	- 3.6	8.8/ 9.0	97
	Rosaceae	06	PS	06	2	1	1	1	10	30	200.0	5/6	- 2.0	8.5/ 9.0	94
	Pl, AQ/EtOH	90	KB	06	B								ED50	M1.0 x 10(2)	
	Mt. Ho-huan, 07/68														
B672037	Spiraea pseudoprunifolia	02	LE	03	8	1	1	1	09	30	150.0	6/6	0.1	9.3/ 8.5	109
	Hay.	02	PS	03	8	1	1	1	10	30	150.0	6/6	- 1.2	13.0/10.6	122
	Rosaceae	90	KB	16	F						Slope	-1.23	ED50	3.0 x 10(1)	
	Lf St, AQ/EtOH														
	Liu-kuei, 11/66														

Table 2 *In Vitro* And *In Vivo* Data On Taiwan Plant Extracts

NSC NO.	BOTANICAL NAME	HOST	TEST SYS.	SCREENER	VEHICLE	ROUTE	DOSE REG.	DAY 1ST INJ.	NO. OF INJ.	DAY OF SAC.	DOSE	SURVIVORS	ANIMAL WT. DIFF.	TUMOR WT. OR SURVIVAL (T./C.)	PERCENT
B626288	Spondias cytherea Sonn.	02	LE	08	8	1	1	1	15	Z	200.0	6/6	- 0.9	10.8/ 8.8	122
	Anacardiaceae	50	WM	08	8	1	1	3	04	07	200.0	5/6	- 3.0	6.3/ 7.3	86
	Pl, AQ/EtOH	90	KB	16	5						Slope	-0.22	ED50	M1.0 x 10(2)	
	Mt. Ali, 01/67														
B626470	Stachyurus himalaicus	02	LE	03	8	1	1	1	09	30	400.0	6/6	- 2.5	9.5/ 8.0	118
	Hook. f. & Thoms.	02	PS	03	8	1	1	1	10	30	100.0	6/6	- 0.5	12.5/11.0	113
	Stachyuraceae	50	WA	03	8	1	1	3	04	07	200.0	6/6	0.0	6.1/ 6.5	93
	Lf St, AQ/EtOH	90	KB	16	5						Slope	-1.07	ED50	2.6 x 10(1)	
	Mt. Ta-hsue, 01/67														
B672771	Stauntonia hexaphylla DC.	02	LE	05	2	1	1	1	09	30	400.0	6/6	- 0.9	9.5/ 9.8	96
	Lardizabalaceae	02	PS	05	2	1	1	1	10	29	400.0	6/6	- 0.7	9.0/ 9.5	94
	Lf St, AQ/EtOH	90	KB	16	5								ED50	M1.0 x 10(2)	
	Mt. Ta-hsue, 01/67														
B626307	Stauntonia obovatifoliola	02	LE	08	8	1	1	1	15	Z	400.0	4/6	- 2.8	7.0/ 7.6	92
	Hay.	50	WM	08	8	1	1	3	04	07	400.0	5/6	- 6.0	4.5/ 8.7	51
	Lardizabalaceae	90	KB	16	5						Slope	-0.32	ED50	M1.0 x 10(2)	
	Pl, AQ/EtOH														
	Mt. Ali, 01/67														
B672033	Stephania cepharantha Hay.	02	LE	03	2	1	1	1	09	30	170.0	6/6	- 0.2	8.2/ 8.5	96
	Menispermaceae	02	PS	03	2	1	1	1	10	30	170.0	6/6	- 0.8	10.7/ 9.1	117
	Lf St, AQ/EtOH	90	KB	16	5						Slope	-0.78	ED50	6.0 x 10(1)	
	Taipei, 12/67														
B603946	Sterculia foetida L.	02	LE	05	2	1	1	1	15	Z	400.0	5/6	- 0.8	9.4/10.0	94
	Sterculiaceae	50	WM	05	2	1	1	3	04	07	400.0	6/6	- 6.0	5.7/ 7.1	80
	Lf St, AQ/EtOH	90	KB	16	5						Slope	-0.61	ED50	5.8 x 10(1)	
	Hengchun, 1965														

Table 2 *In Vitro* And *In Vivo* Data On Taiwan Plant Extracts

NSC NO.	BOTANICAL NAME	HOST	TEST SYS.	SCREENER	VEHICLE	ROUTE	DOSE REG.	DAY 1ST INJ.	NO. OF INJ.	DAY OF SAC.	DOSE	SURVIVORS	ANIMAL WT. DIFF.	TUMOR WT. OR SURVIVAL (T./C.)	PERCENT
B626467	Stranvaesia niitakayamensis	02	LE	03	2	1	1	1	09	30	400.0	6/6	- 0.9	9.2/ 8.0	115
	(Hay.) Hay.	50	WA	03	2	1	1	3	04	07	400.0	7/7	- 5.0	4.1/ 5.9	69
	Rosaceae	90	KB	16	5						Slope	-0.34	ED50	M1.0 x 10(2)	
	Lf St, AQ/EtOH														
	Mt. Ta-hsue, 01/67														
B603947	Strelitzia nicolai	02	LE	05	2	1	1	1	15	Z	400.0	4/6	- 0.5	10.3/10.0	103
	Regel & Koch	50	WM	05	2	1	1	3	04	07	400.0	5/6	- 9.0	4.5/ 7.1	63
	Strelitziaceae	90	KB	16	5								ED50	M1.0 x 10(2)	
	Lf St, AQ/EtOH														
	Hengchun, 1965														
B626285	Strobilanthes flexicaulis	02	LE	08	8	1	1	1	15	Z	400.0	6/6	- 0.2	7.7/ 7.6	101
	Hay.	50	WM	08	8	1	1	3	04	07	400.0	6/6	1.0	7.1/ 8.7	81
	Acanthaceae	90	KB	16	5						Slope	-0.26	ED50	M1.0 x 10(2)	
	Pl, AQ/EtOH														
	Mt. Ali, 01/67														
B603948	Strychnos nux-vomica L.	02	LE	05	2	1	1	1	15	Z	50.0	6/6	0.9	10.0/10.0	100
	Loganiaceae	50	WM	05	2	1	1	3	04	07	50.0	4/6	2.0	6.5/ 7.1	91
	Lf St, AQ/EtOH	90	KB	16	5								ED50	M1.0 x 10(2)	
	Hengchun, 1965														
B603949	Swietenia macrophylla King	02	LE	05	2	1	1	1	15	Z	200.0	6/6	- 1.1	9.5/ 9.7	97
	Meliaceae	50	WM	05	2	1	1	3	04	07	200.0	6/6	1.0	5.0/ 7.1	70
	Lf St, AQ/EtOH	90	KB	16	5								ED50	M1.0 x 10(2)	
	Hengchun, 1965														
B672850	Symplocos cochinchinensis	02	LE	02	C	1	1	1	09	30	400.0	6/6	- 3.1	9.5/ 8.7	109
	(Lour.) Moore	02	PS	02	2	1	1	1	10	30	400.0	5/6	- 2.8	11.0/10.5	104
	Symplocaceae	90	KB	16	2								ED50	M1.0 x 10(2)	
	Lf St, AQ/EtOH														
	Mt. Ch'i-hsing, 11/66														

Table 2 *In Vitro* And *In Vivo* Data On Taiwan Plant Extracts

NSC NO.	BOTANICAL NAME	HOST	TEST SYS.	SCREENER	VEHICLE	ROUTE	DOSE REG.	DAY 1ST INJ.	NO. OF INJ.	DAY OF SAC.	DOSE	SURVIVORS	ANIMAL WT. DIFF.	TUMOR WT. OR SURVIVAL (T./C.)	PERCENT
B672877	Symplocos konishii Hay.	02	LE	02	2	1	1	1	09	30	400.0	6/6	- 3.3	9.7/ 9.1	106
	Symplocaceae	02	PS	02	2	1	1	1	10	39	400.0	5/6	- 2.6	12.0/12.0	100
	Lf St, AQ/EtOH	90	KB	16	5						Slope	-0.16	ED50	M1.0 x 10(2)	
	Mt. Ta-hsue, 01/67														
B602050	Symplocos lancifolia	02	LE	03	8	1	1	1	09	30	170.0	5/6	- 1.7	7.8/ 8.8	88
	Sieb. & Zucc.	02	PS	03	8	1	1	1	10	30	170.0	6/6	- 0.8	12.3/12.4	99
	Symplocaceae	90	KB	16	2						Slope	-0.98	ED50	2.2 x 10(1)	
	Lf St, AQ/EtOH														
	Mt. Ta-hsue, 11/66														
B626325	Symplocos morrisonicola	02	LE	08	8	1	1	1	15	Z	400.0	6/6	- 2.4	9.0/ 8.2	109
	Hay.	50	WM	08	8	1	1	3	04	07	400.0	6/6	- 1.0	5.9/ 8.6	68
	Symplocaceae	90	KB	16	5						Slope	-0.62	ED50	3.4 x 10(1)	
	Pl, AQ/EtOH														
	Mt. Ali, 01/67														
B672095	Synedrella nodiflora Gaertn.	02	LE	08	2	1	1	1	09	30	300.0	5/6	- 5.4	8.4/ 9.7	86
	Compositae	02	PS	08	2	1	1	1	10	30	150.0	6/6	- 1.9	11.5/11.0	104
	Lf St, AQ/EtOH	90	KB	16	5						Slope	-0.64	ED50	6.6 x 10(1)	
	Chiayi, 11/66														
B603950	Syzygium buxifolium	02	LE	05	2	1	1	1	15	Z	100.0	6/6	- 2.1	9.2/ 9.7	94
	H. & Arn.	50	WM	05	2	1	1	3	04	07	100.0	6/6	4.0	8.6/ 7.1	121
	Myrtaceae	90	KB	16	5								ED50	M1.0 x 10(2)	
	Hengchun, 1965														
B672058	Syzygium somai (Hay.) Mori	02	LE	03	8	1	1	1	09	30	200.0	6/6	- 1.6	8.0/ 8.8	90
	Myrtaceae	02	PS	03	8	1	1	1	10	30	200.0	6/6	- 0.9	9.2/10.1	91
	Lf St, AQ/EtOH	90	KB	16	5						Slope	-0.34	ED50	4.7 x 10(1)	
	Liu-kuei, 11/66														

Table 2 *In Vitro* And *In Vivo* Data On Taiwan Plant Extracts

NSC NO.	BOTANICAL NAME	HOST	TEST SYS.	SCREENER	VEHICLE	ROUTE	DOSE REG.	DAY 1ST INJ.	NO. OF INJ.	DAY OF SAC.	DOSE	SURVIVORS	ANIMAL WT. DIFF.	TUMOR WT. OR SURVIVAL (T./C.)	PERCENT
B672122	Tabernaemontana sp.	02	LE	08	2	1	1	1	09	30	150.0	6/6	- 1.0	9.0/ 9.4	95
	Apocynaceae	02	PS	08	2	1	1	1	10	30	150.0	4/6	- 1.3	11.5/10.0	115
	Rt, AQ/EtOH	90	KB	16	5								ED50	M1.0 x 10(2)	
	Hengchun, 07/68														
B672852	Taiwania cryptomerioides	02	LE	02	2	1	1	1	09	30	75.0	6/6	- 2.2	8.8/ 8.7	101
	Hay.	02	PS	02	2	1	1	1	10	30	75.0	6/6	- 1.5	9.5/ 8.5	111
	Taxodiaceae	90	KB	16	5						Slope	-0.88	ED50	1.9 x 10(1)	
	Lf St, AQ/EtOH														
	Mt. Ch'i-hsing, 11/66														
B603951	Tamarindus indica L.	02	LE	05	2	1	1	1	15	Z	400.0	6/6	- 1.5	8.3/10.0	83
	Leguminosae	50	WM	05	2	1	1	3	04	07	400.0	6/6	5.0	5.2/ 7.1	73
	Lf St, AQ/EtOH	90	KB	16	E						Slope	-0.25	ED50	M1.0 x 10(1)	
	Hengchun, 1965														
B672163	Tamarix juniperina Bunge	06	LE	06	2	1	1	1	09	30	75.0	6/6	- 3.8	9.0/ 9.0	100
	Tamaricaceae	06	PS	06	2	1	1	1	10	30	75.0	6/6	- 2.7	8.0/ 9.0	88
	Lf, AQ/EtOH	90	KB	06	B						Slope	-0.97	ED50	3.7 x 10(1)	
	Chiayi, 01/67														
B603952	Taraxacum formosanum Kitam.	02	LE	05	2	1	1	1	15	Z	400.0	4/6	- 0.8	10.0/10.0	100
	Compositae	50	WM	05	2	1	1	3	04	07	400.0	6/6	- 7.0	4.2/ 6.0	70
	Lf St, AQ/EtOH	90	KB	16	5						Slope	-1.10	ED50	2.9 x 10(1)	
	Hengchun, 1965														
B603953	Terminalia arjuna Bedd.	02	LE	05	2	1	1	1	15	Z	200.0	6/6	- 1.9	9.2/ 9.7	94
	Combretaceae	50	WM	05	2	1	1	3	04	07	200.0	6/6	2.0	4.6/ 6.0	76
	Lf St, AQ/EtOH	90	KB	16	5						Slope	-0.86	ED50	3.9 x 10(1)	
	Hengchun, 1965														

Table 2 *In Vitro* And *In Vivo* Data On Taiwan Plant Extracts

NSC NO.	BOTANICAL NAME	HOST	TEST SYS.	SCREENER	VEHICLE	ROUTE	DOSE REG.	DAY 1ST INJ.	NO. OF INJ.	DAY OF SAC.	DOSE	SURVIVORS	ANIMAL WT. DIFF.	TUMOR WT. OR SURVIVAL (T./C.)	PERCENT
B603954	Terminalia catappa L.	02	LE	05	2	1	1	1	15	Z	400.0	6/6	- 1.4	9.2/10.0	92
	Combretaceae	50	WM	05	2	1	1	3	04	07	400.0	6/6	- 5.0	4.9/ 6.0	81
	Lf St, AQ/EtOH	90	KB	16	5								ED50	M1.0 x 10(2)	
	Hengchun, 1965														
B672059	Ternstroemia gymnanthera	02	LE	03	2	1	1	1	09	30	85.0	6/6	- 1.3	8.5/ 8.8	96
	Sprague	02	PS	03	2	1	1	1	10	30	85.0	6/6	- 1.4	11.8/10.1	116
	Theaceae	90	KB	16	2						Slope	-0.46	ED50	9.6 x 10(1)	
	Lf St, AQ/EtOH														
	Liu-kuei, 11/66														
B672854	Tetrastigma formosana	02	LE	02	2	1	1	1	09	30	150.0	6/6	- 3.2	8.0/ 8.7	91
	(Heyne) Nakai	02	PS	02	2	1	1	1	10	30	75.0	6/6	- 1.8	11.0/11.0	100
	Vitaceae	90	KB	16	2								ED50	M1.0 x 10(2)	
	Lf St, AQ/EtOH														
	Mt. Ch'i-hsing, 11/66														
B672899	Thladiantha punctata Hay.	02	LE	02	2	1	1	1	09	30	400.0	6/6	- 2.0	9.0/ 9.4	95
	Cucurbitaceae	02	PS	02	2	1	1	1	10	30	100.0	6/6	- 1.2	11.5/11.0	104
	Pl, AQ/EtOH	90	KB	16	5								ED50	M1.0 x 10(2)	
	Mt. Ch'i-hsing, 11/66														
B626473	Toddalia asiatica (L.) Lam.	02	LE	03	8	1	1	1	09	30	400.0	6/6	- 1.4	8.3/ 8.0	103
	Rutaceae	50	WM	03	8	1	1	3	04	07	400.0	6/7	- 5.0	5.1/ 5.4	94
	Lf St, AQ/EtOH	90	KB	16	5						Slope	-0.78	ED50	4.4 x 10(1)	
	Chiayi, 01/67														
B603955	Toona calanthas	02	LE	05	2	1	1	1	15	Z	400.0	5/6	- 1.4	9.8/10.0	98
	Merr.	50	WM	05	2	1	1	3	04	07	400.0	6/6	- 4.0	3.8/ 6.0	63
	Meliaceae	90	KB	16	5								ED50	M1.0 x 10(2)	
	Lf St, AQ/EtOH														
	Hengchun, 1965														

Table 2 *In Vitro* And *In Vivo* Data On Taiwan Plant Extracts

NSC NO.	BOTANICAL NAME	HOST	TEST SYS.	SCREENER	VEHICLE	ROUTE	DOSE REG.	DAY 1ST INJ.	NO. OF INJ.	DAY OF SAC.	DOSE	SURVIVORS	ANIMAL WT. DIFF.	TUMOR WT. OR SURVIVAL (T./C.)	PERCENT
B672101	Trichodesma khasianum	02	LE	08	2	1	1	1	09	30	400.0	6/6	- 2.4	9.3/ 9.9	93
	Clarke	02	PS	08	2	1	1	1	10	30	400.0	6/6	- 3.1	10.0/11.0	90
	Boraginaceae	90	KB	16	5						Slope	-0.85	ED50	1.7 x 10(1)	
	Lf St, AQ/EtOH														
	Chiayi, 11/66														
B672861	Tridax procumbens L.	02	LE	02	2	1	1	1	09	30	400.0	5/6	- 3.8	9.8/ 9.1	107
	Compositae	02	PS	02	2	1	1	1	10	30	400.0	5/6	- 2.5	9.0/ 9.0	100
	Pl, AQ/EtOH	90	KB	16	5						Slope	-0.38	ED50	7.6 x 10(1)	
	Liu-kuei, 11/66														
B672191	Tsuga formosana Hay.	06	LE	06	2	1	1	1	09	30	150.0	6/6	- 1.9	8.8/ 9.0	97
	Pinaceae	06	PS	06	2	1	1	1	10	30	150.0	6/6	- 1.5	8.5/ 9.0	94
	Px, AQ/EtOH	90	KB	06	B						Slope	-0.71	ED50	3.6 x 10(1)	
	Mt. Ho-huan, 07/68														
B672818	Tutcheria shinkoensis	06	LE	06	9	1	1	1	09	30	400.0	6/6	- 1.7	9.0/ 8.5	105
	(Hay.) Nakai	02	PS	06	2	1	1	1	10	30	400.0	6/6	- 2.2	11.0/11.0	100
	Theaceae	90	KB	06	9								ED50	M1.0 x 10(2)	
	Lf St, AQ/EtOH														
	Mt. Ch'i-hsing, 11/66														
B626474	Ulmus parvifolia Jacq.	02	LE	03	8	1	1	1	09	30	400.0	6/6	- 1.4	8.8/ 8.0	110
	Ulmaceae	50	WA	03	8	1	1	3	04	07	400.0	7/7	- 9.0	4.6/ 5.4	85
	Lf St, AQ/EtOH	90	KB	16	5						Slope	-1.13	ED50	2.8 x 10(1)	
	Liu-kuei, 01/67														
B672814	Uncaria hirsuta Haviland	02	LE	06	2	1	1	1	09	30	400.0	6/6	0.3	9.0/ 9.1	98
	Rubiaceae	02	PS	06	2	1	1	1	10	30	400.0	6/6	- 1.5	14.0/14.0	100
	Lf St, AQ/EtOH	90	KB	06	9								ED50	M1.0 x 10(2)	
	Mt. Ta-hsuè, 01/67														

Table 2 *In Vitro* And *In Vivo* Data On Taiwan Plant Extracts

NSC NO.	BOTANICAL NAME	HOST	TEST SYS.	SCREENER	VEHICLE	ROUTE	DOSE REG.	DAY 1ST INJ.	NO. OF INJ.	DAY OF SAC.	DOSE	SURVIVORS	ANIMAL WT. DIFF.	TUMOR WT. OR SURVIVAL (T./C.)	PERCENT
B626249	Urena lobata L.	02	LE	03	8	1	1	1	15	Z	400.0	6/6	- 1.2	8.2/ 8.7	94
	Malvaceae	50	WM	03	8	1	1	3	04	07	400.0	7/7	- 8.0	8.0/11.1	72
	Lf St, AQ/EtOH	90	KB	16	5								ED50	Ml.0 x 10(2)	
	Hengchun, 11/64														
B672176	Vaccinium bracteatum Thunb.	06	LE	06	2	1	1	1	09	30	400.0	6/6	- 0.9	8.8/ 8.9	98
	Ericaceae	02	PS	06	2	1	1	1	10	30	400.0	5/6	0.0	10.5/12.0	87
	Px, AQ/EtOH	90	KB	06	B						Slope	-0.44	ED50	4.9 x 10(1)	
	Mt. Ho-huan, 07/68														
B672042	Vaccinium emarginatum Hay.	02	LE	03	8	1	1	1	09	30	200.0	6/6	- 0.2	8.7/ 8.8	98
	Ericaceae	02	PS	03	8	1	1	1	10	30	200.0	6/6	- 1.2	9.5/ 9.1	104
	Lf St, AQ/EtOH	90	KB	16	F						Slope	-1.14	ED50	2.7 x 10(1)	
	Mt. Ta-hsue, 11/66														
B672807	Ventilago elegans Hemsl.	02	LE	06	2	1	1	1	09	30	400.0	6/6	- 1.6	8.7/ 9.4	92
	Rhamnaceae	02	PS	06	2	1	1	1	10	30	200.0	6/6	- 2.9	11.0/11.0	100
	Pl, AQ/EtOH	90	KB	06	9								ED50	Ml.0 x 10(2)	
	Mt. Ta-hsue, 01/67														
B672755	Veronica morrisonicola Hay.	06	LE	06	2	1	1	1	09	30	400.0	6/6	- 0.2	8.7/ 9.0	96
	Scrophulariaceae	06	PS	06	2	1	1	1	10	30	400.0	6/6	- 1.0	9.0/ 9.0	100
	Pl, AQ/EtOH	90	KB	06	B								ED50	Ml.0 x 10(2)	
	Mt. Ho-huan, 07/68														
B672756	Veronica spuria L.	02	LE	06	2	1	1	1	09	30	400.0	6/6	0.3	8.8/ 9.4	93
	Scrophulariaceae	02	PS	06	2	1	1	1	10	30	400.0	6/6	- 1.1	7.0/ 7.0	100
	Pl, AQ/EtOH	90	KB	06	B								ED50	Ml.0 x 10(2)	
	Mt. Ho-huan, 07/68														

Table 2 *In Vitro* And *In Vivo* Data On Taiwan Plant Extracts

NSC NO.	BOTANICAL NAME	HOST	TEST SYS.	SCREENER	VEHICLE	ROUTE	DOSE REG.	DAY 1ST INJ.	NO. OF INJ.	DAY OF SAC.	DOSE	SURVIVORS	ANIMAL WT. DIFF.	TUMOR WT. OR SURVIVAL (T./C.)	PERCENT
B626294	Viburnum foetidum Wall.	02	LE	08	8	1	1	1	15	Z	400.0	6/6	- 0.5	7.8/ 7.6	102
	var. rectangulatum	50	WM	08	Y	1	1	3	04	07	400.0	6/6	1.0	6.1/ 8.7	70
	(Graeb.) Nakai	90	KB	16	5						Slope	-0.91	ED50	3.4 x 10(1)	
	Caprifoliaceae														
	Pl, AQ/EtOH														
	Mt. Ali, 01/67														
B603957	Viburnum odoratissimum Ker.	02	LE	05	2	1	1	1	15	Z	400.0	6/6	- 0.2	9.7/10.0	97
	Caprifoliaceae	50	WM	05	2	1	1	3	04	07	400.0	6/6	3.0	6.4/ 5.9	108
	Fl, AQ/EtOH	90	KB	16	5								ED50	M1.0 x 10(2)	
	Hengchun, 1965														
B672789	Viburnum taiwanianum Hay.	02	LE	C6	2	1	1	1	09	30	400.0	6/6	- 1.5	8.5/ 8.5	100
	Caprifoliaceae	02	PS	06	2	1	1	1	10	30	100.0	6/6	- 1.3	9.5/11.0	86
	Lf St, AQ/EtOH	90	KB	06	9								ED50	M1.0 x 10(2)	
	Mt. Ali, 01/67														
B672785	Villebrunea pedunculata	02	LE	05	2	1	1	1	09	30	400.0	6/6	- 1.4	9.0/ 9.8	91
	Shirai	02	PS	05	2	1	1	1	10	29	400.0	6/6	- 3.0	11.0/ 9.5	115
	Urticaceae	90	KB	16	5						Slope	-0.50	ED50	M1.0 x 10(2)	
	Pl, AQ/EtOH														
	Chiayi, 11/66														
B672185	Viscum multinerve Hay.	02	LE	06	2	1	1	1	09	30	400.0	6/6	- 0.5	8.8/ 9.4	93
	Loranthaceae	02	PS	06	2	1	1	1	10	30	400.0	6/6	- 1.2	11.5/11.0	104
	Px, AQ/EtOH	90	KB	06	B								ED50	M1.0 x 10(2)	
	Mt. Ho-nuan, 07/68														
B626275	Vitex negundo L.	02	LE	03	2	1	1	1	15	Z	400.0	6/6	- 1.1	8.2/ 8.0	102
	Verbenaceae	50	WM	03	2	1	1	3	04	07	400.0	7/7	- 9.0	7.4/10.9	67
	Pl, AQ/EtOH	90	KB	16	5						Slope	-0.66	ED50	3.2 x 10(1)	
	Hengchun, 11/64														

Table 2 *In Vitro* And *In Vivo* Data On Taiwan Plant Extracts

NSC NO.	BOTANICAL NAME	HOST	TEST SYS.	SCREENER	VEHICLE	ROUTE	DOSE REG.	DAY 1ST INJ.	NO. OF INJ.	DAY OF SAC.	DOSE	SURVIVORS	ANIMAL WT. DIFF.	TUMOR WT. OR SURVIVAL (T./C.)	PERCENT
B626328	Vitis shifunensis Hay.	02	LE	08	8	1	1	1	15	Z	400.0	6/6	- 3.9	7.8/ 8.2	95
	Vitaceae	50	WM	08	8	1	1	3	04	07	400.0	6/6	- 2.0	5.3/ 8.6	61
	Pl, AQ/EtOH	90	KB	16	5						Slope	-0.47	ED50	1.0 x 10(2)	
	Hengchun, 11/65														
B603958	Vitis sp.	02	LE	05	2	1	1	1	15	Z	200.0	6/6	- 0.7	9.7/10.0	97
	Vitaceae	50	WM	05	2	1	1	3	04	07	200.0	6/6	- 2.0	4.3/ 5.9	72
	Lf St, AQ/EtOH	90	KB	16	5						Slope	-1.00	ED50	3.0 x 10(1)	
	Hengchun, 1965														
B672820	Vittaria taeniophylla	06	LE	06	9	1	1	1	09	30	400.0	6/6	- 2.7	8.7/ 8.5	102
	Copel.	02	PS	06	2	1	1	1	10	30	400.0	6/6	- 3.2	11.0/11.0	100
	Vittariaceae	90	KB	06	9								ED50	Ml.0 x 10(2)	
	Pl, AQ/EtOH														
	Mt. Ta-hsue, 01/67														
B672732	Wendlandia erythroxylon Cow.	02	LE	05	2	1	1	1	09	30	400.0	6/6	- 1.3	9.8/ 9.8	100
	Rubiaceae	02	PS	05	2	1	1	1	10	29	400.0	6/6	- 1.1	11.0/ 9.5	115
	Lf St, AQ/EtOH	90	KB	16	F						Slope	-1.18	ED50	2.9 x 10(1)	
	Mt. Ta-hsue, 11/66														
B672853	Wikstroemia mononectaria	02	LE	02	2	1	1	1	09	30	40.0	4/6	- 4.9	9.5/ 8.7	109
	Hay.	02	PS	02	2	1	1	1	10	30	40.0	5/6	- 5.3	12.0/13.0	92
	Thymelaeaceae	90	KB	16	5								ED50	Ml.0 x 10(2)	
	Lf St, AQ/EtOH														
	Mt. Ch'i-hsing, 11/66														
B603959	Yucca gloriosa L.	02	LE	05	2	1	1	1	15	Z	400.0	6/6	- 0.1	10.3/10.0	103
	Liliaceae	50	WM	05	2	1	1	3	04	07	400.0	6/6	- 8.0	5.6/ 5.9	94
	Lf St, AQ/EtOH	90	KB	16	5						Slope	-0.81	ED50	4.8 x 10(1)	
	Hengchun, 1965														

Table 2 *In Vitro* And *In Vivo* Data On Taiwan Plant Extracts

NSC NO.	BOTANICAL NAME	HOST	TEST SYS.	SCREENER	VEHICLE	ROUTE	DOSE REG.	DAY 1ST INJ.	NO. OF INJ.	DAY OF SAC.	DOSE	SURVIVORS	ANIMAL WT. DIFF.	TUMOR WT. OR SURVIVAL (T./C.)	PERCENT
B672047	Yushania niitakayamensis	02	LE	03	2	1	1	1	09	30	200.0	5/6	0.4	8.6/ 8.8	97
	(Hay.) Keng. f.	02	PS	03	2	1	1	1	10	30	200.0	6/6	- 0.7	9.8/10.1	97
	Gramineae	90	KB	16	F						Slope	1.26	ED50	3.1 x 10(1)	
	Lf St, AQ/EtOH														
	Mt. Ta-hsue, 11/66														

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Antineoplastic Substances From the Sea: A Review [1,2]

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I. INTRODUCTION

With the recent increasing interest in the sea as a source of biomedical products, a number of books, reviews, and symposia have been published including those by Baslow, Freudenthal, Nigrelli, and others (5, 7, 19, 25, 27, 31, 36, 39, 43, 44, 49, 58, 65, 87, 95, 97, 108, 109, 111, 112, 137, 144, 147). In this article an attempt is made to present the evidence as to the status of antitumor agents from the sea, derived from both animals and plants, including methods of preparation, methods of testing, biochemical characteristics, and possible mode of action of these agents. Certain studies are presented in more detail in order to provide an additional basis for examination of the prospects for progress in organized systematic research in this field.

To date, no clinically useful antitumor drug has been developed from the sea except cytosine arabinoside [6] whose synthesis was based

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[5] The authors thank Mr. S. J. Jackson, Mrs. Lois Chang, and the staff of the National Library of Medicine for valuable assistance in supplying references.

[6] Cytosine arabinoside: NSC-63878; CAS reg. No. 69-74-9; cytosine, 1-β-D-arabinofuranosyl-, monohydrochloride.

on the study of the antitumor activity in the sponge (33). Many of the reported agents represent only crude materials and very often standard techniques for testing were not used. Variable tumor systems have been employed to study antitumor effects, making comparisons difficult. Some agents show activity against a tumor system such as Sarcoma 180 (S180) but do not inhibit the possibly more clinically predictive L1210 leukemia. In many cases there has been insufficient data concerning the chemical and physical properties of the preparations and very little has been reported concerning their mode of action.

Most of the antitumor agents are cytotoxic in their action and also demonstrate toxicity for the host. Many of the substances, as far as they have been isolated, are protein in nature and therefore are not easy to purify. Of interest, the sea animals themselves, such as mollusks, do develop tumors (45) indicating that the presence of any antitumor substance in their body does not necessarily prevent tumor formation.

Nevertheless, it is perhaps not surprising that until now no clinical antineoplastic agents have been developed from the sea, for, in comparison with the enormous amount of effort spent on terrestrial antitumor drugs, that spent on marine antineoplastic agents has been very little. However, a number of agents from the sea have been active in tumor systems and although they have not reached clinical trial they have nevertheless been useful as experimental tools for studies in antineoplastic chemotherapy.

The activity of a given agent from the sea may depend upon the method of preparation, and the possibility exists that mild activity exhibited with one method of preparation may be increased if a more appropriate method is employed, particularly where means of chemical purification can be devised. For this reason the methods of preparation of the antitumor agents are described. As soon as the chemical structure of an active agent is known, related compounds with greater activity may be synthesized.

With increasing stress on the importance of immunotherapy, it would appear desirable to look not only for chemotherapeutic agents to kill the cancer cells but also for agents which can stimulate the host's immunologic defenses against neoplastic growth. The current literature concerning antineoplastic substances from the sea may provide a possible foundation upon which future progress may be made.

Historically, seaweed and sea clams were used in Chinese traditional medicine for treatment of "cancer" thousands of years ago (57). Corsican moss, an alga, was popularly used in Corsica for cancer, a fact noted by Napoleon Bonaparte who died of stomach cancer.

In modern times, Nigrelli in 1952 was the first to show that extracts of a marine animal, the sea cucumber, possessed antitumor activity (90). He suggested that the ocean and its inhabitants might become important sources of new and better antibiotics and anticancer drugs (93). Schmeer (114,115) in 1964 observed that extracts of the shucked hard clam from the sea were capable of inhibiting the growth of S180 in Swiss mice. Li, Prescott, and their associates, who have studied the antimicrobial effect of mollusk extracts named paolins since 1960, found that some of their extracts also possessed antitumor activities (70). Subsequently, a number of authors demonstrated antitumor activity in various marine products (7,24,25,80,101,128,138). In this article the mollusk extracts which have been relatively thoroughly tested in vivo will be described first, followed by the reported antitumor substances found in the sea including those indirectly related to cancer therapy such as growth inhibitors, reticuloendothelial system stimulants, and immune modifiers. Individual reports are summarized in the appendix at the end of the text (appendix I).

II. ANTINEOPLASTIC SUBSTANCES FROM MOLLUSKS

A. Preparation and Assay

1. Mercenene

In 1964 Schmeer, while working in Szent-Györgyi's laboratory, first reported the presence of growth-inhibiting agents in extracts of the common edible clam, the quahog (*Mercenaria mercenaria*) (114,115), and some other shellfish. In a series of papers (116–124) the

author and her associates described the chemical characteristics and biologic and antitumor activity of the agent named mercenene. The agent inhibited the growth of HeLa cells in tissue culture and S180 and Krebs 2 carcinoma in mice.

Two main types of extracts, crude aqueous and partially purified, were described.

a. Crude aqueous extracts

i. Method of preparation.—Crude aqueous extracts were made from the following mollusks: clam (*Mercenaria mercenaria*), oyster (*Ostrea virginica*), whelk (*Busycon canaliculatum*), snail (*Helix sp.*) (116), and squid (*Loligo sp.*) (116). Fresh, live specimens of each species were prepared for extraction by first removing the animals from their respective valves (except the squid). The animals of each species were then ground separately in a Waring blendor. One g of suspension was added to 100 ml of sterile water and was allowed to settle in a separatory funnel, and the remaining sediment was removed by centrifugation at 1500 rpm for 15 minutes at room temperature. The supernate was decanted and constituted the fluid crude extract. It was refrigerated and stored for test purposes. In Schmeer's earlier studies (115) the shucked clams were homogenized in water and then precipitated with 20% $(NH_4)_2SO_4$. The homogenate was centrifuged and the supernatant was dialyzed and lyophilized.

ii. In vivo assay.—Assay was done in Swiss white mice implanted with S180 by the trocar method. The crude water extracts used for treatment were given at the dosage of 2 ml/day intraperitoneally (ip) for 6 days, starting 1 day after tumor implantation. A daily record of mean body weight and mortality rate for each group, including the control animals, was kept. The results are shown in figure 1. Squid, snail, and oyster gave approximately the same results. Whelk had the least amount of antitumor activity. The clam showed the greatest amount of antineoplastic activity (122).

b. Partially purified extracts

i. Method of preparation.—The crude aqueous extract as described above was applied to a Sephadex column, G25, with a void volume of 80 ml. Appropriate buffer of neutral 0.1 M NaCl was used as the elution fluid. The second void (80 ml) contained most of the antitumor activity. This constituted the partially purified extract.

ii. In vivo assay.—CF_1 female mice were given approximately 3×10^7 Krebs 2 ascites cells subcutaneously (sc). These cells were from 8–12-week-old CF_1 females that had received 3×10^7 ascites cells ip 1 week before harvesting. Four days after sc implantation, a palpable solid tumor with a diameter of 5–8 mm was seen in 100% of these animals. The mice, chosen randomly, were divided into ex-

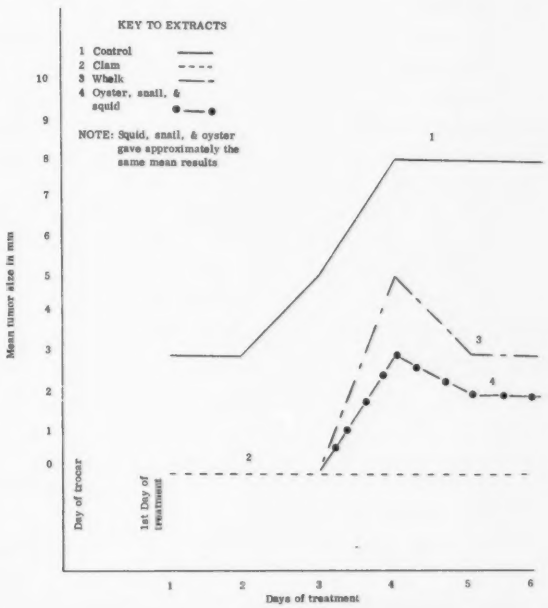
KEY TO EXTRACTS
1 Control
2 Clam
3 Whelk
4 Oyster, snail, & squid
NOTE: Squid, snail, & oyster gave approximately the same mean results
Mean tumor size in mm
Day of trocar
1st Day of treatment
Days of treatment

FIGURE 1.—Effects of mollusk extracts on tumor growth of S180 in Swiss albino mice. [Reprinted with permission from ref 116.] Data given show the mean tumor growth for each group during the days of treatment. As can be seen, the *Mercenaria m.* extract showed the greatest antitumor activity. Next in effectiveness were the oyster, squid, and snail. For the sake of convenience, because of an almost identical effect on tumor growth, these latter 3 extracts are grouped together. Whelk extract evidenced the least activity of all the material tested. Growth of S180 in control animals followed the usual pattern for Swiss mice of this age. By the 10th day all control animals were dead. Surviving mice produced normal litters of offspring.

perimental and control groups of ten to 15 animals. Animals treated with partially purified extracts received 0.25 ml of mercenene each day for 7 days sc in the left axillary region. Control animals received 0.25 ml of placebo (sterile physiologic saline). On Day 8, the tumors were excised from all groups and weighed. The ratio of combined tumor weights for the two groups (T/C) was taken as the index of extract activity. As shown in table 1, the mean tumor weight in the treated mice was 620 ±49 mg while that of the untreated mice was 2450 ±125 mg. At 180 days following initiation of treatment, 41 of 45 mice in the treated group had survived while none of the 45 mice in the untreated group had survived.

2. *Paolins*

The results of the studies by Li, Prescott, and their associates on a number of substances from marine animals as potential antimicrobial agents (66–69) indicated that certain substances present in the abalone, oyster, common clam, queen conch, squid, and sea snail possess antibacterial and antiviral activity in vivo and in vitro. The antibacterial and antiviral substances were then named paolin 1 and paolin 2 respectively. Following Schmeer's work, Li and his associates prepared ammonium sulfate and water extracts of the clam and demonstrated the prophylactic effect of these extracts against adenovirus 12-induced tumors in hamsters (70). Li and his associates prepared two main types of extracts: a water extract of the whole clam and a partially purified extract of the clam's liver which is designated paolin 3.

a. Extracts of whole clam

Fresh shucked clams were homogenized with an equal volume of cold distilled water (4 C) in a Waring blendor. The homogenate was stirred at 4° C for 1–2 hours and then centrifuged at 2000 rpm (600 × *g*) for 20 minutes. The supernate was dialyzed against distilled water for 72 hours and then lyophilized. The yield, a light brown powder, was approximately 3% of the wet weight of the whole clam.

b. Clam liver extracts (CLE) (paolin 3)

The crude clam extracts contained large quantities of extraneous material which interfered with identification and purification of the active factor. Liu and Cipolla (79), in studies of the antiviral effect of clam extracts against the PR8 influenza A virus in 10–11-day-old chick embryos, dissected out different organ systems of the clam and found that the liver (digestive diverticulum) contained most of the antiviral activity. The remaining parts of the body and shell liquor contained very little activity. The active factor from the liver was precipitable by 30% cold methanol and

TABLE 1.—Effectiveness of mercenene against the Krebs 2 carcinoma in mice *
(reprinted from ref 122)

MTW ± SE† (mg)	MTW ± SE‡ (mg)		Mean survival§		
				No. of animals	
	Untreated	Treated	Days	Untreated	Treated
450 ± 38	2450 ± 125	620 ± 49	8	45	45
			28	0	42
			180	0	41

*The values are averages of 3 experiments, Nos. 1–3. A total of 180 CF_1 female mice (15–18 g) were used; sc treatment with mercenene was begun 4 days after tumors were implanted in 75 animals taken at random; 75 mice served as controls; 8 mg of mercenene was given each day for 7 consecutive days.

†MTW = mean tumor weight; SE = standard error. Four days after implant of tumor and before treatment was begun, 30 mice were killed and tumors were excised, weighed, and studied histologically.

‡After a 7-day dosage schedule, 30 mice from the 75 in the treated group and 30 mice from the 75 in the control group were killed, and tumors were excised, weighed, and studied histologically.

§After 180 days, the surviving mice were killed.

was soluble in 8% NaCl solution with pH above neutral. The extract inhibited PR8 influenza A virus in the chicken embryo system. Several other species of shellfish from the west coast were also examined and a similar factor was recoverable from their livers.

Li, Liu, and Prescott prepared CLE in the following manner (72,80). Fresh clams were frozen in their shells and then thawed at room temperature for about 1 hour, following which the livers were excised and freed from most of the surrounding tissues. The livers were homogenized in cold distilled water and the homogenate was centrifuged to remove the insoluble residue. The soluble supernatant was precipitated by cold ethyl alcohol at a final concentration of 70%. The precipitate was redissolved in 8% NaCl solution and centrifuged, and the supernatant was dialyzed and lyophilized. The yield was approximately 0.6% of wet weight of liver or 0.02% of the whole clam (fig 2).

B. Biologic Activities and Toxicity

1. Effect on solid tumors

The inhibitory effect of the crude clam extracts against S180 and Krebs 2 ascites tumor in mice has already been mentioned. Additionally, Fishtein (34) also demonstrated antitumor activity of an aqueous extract of the clam against S180. The raw clams were homogenized with an equal volume of distilled water. The extract was centrifuged for 20–30 minutes at 4000–5000 rpm at room temperature. The supernatant was stored at 4°C and used undiluted or diluted with distilled water to 10%–75%. Swiss mice bearing palpable S180 were treated ip with 0.25 ml of the undiluted or diluted extract for 7 days. The mice were then killed and the mean tumor weights of each treated group (T) and control group (C) were compared. It was found that the tumor growth was inhibited in the treated groups and the best results were obtained when the mice were treated with a dilution containing 25% of the crude extract (T/C = 32%).

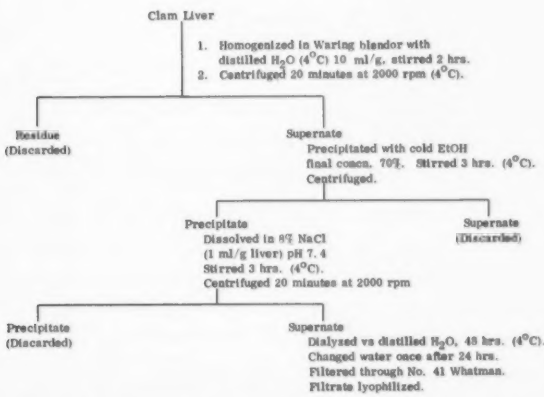
Clam Liver
1. Homogenized in Waring blendor with distilled H_2O (4°C) 10 ml/g, stirred 2 hrs.
2. Centrifuged 20 minutes at 2000 rpm (4°C).
Residue (Discarded)
Supernate
Precipitated with cold EtOH final concn. 70%. Stirred 3 hrs. (4°C). Centrifuged.
Precipitate
Dissolved in 8% NaCl (1 ml/g liver) pH 7.4 Stirred 3 hrs. (4°C). Centrifuged 20 minutes at 2000 rpm
Supernate (Discarded)
Precipitate (Discarded)
Supernate
Dialyzed vs distilled H_2O, 48 hrs. (4°C). Changed water once after 24 hrs. Filtered through No. 41 Whatman. Filtrate lyophilized.

FIGURE 2.—Procedure for preparation of CLE. [Reprinted with permission from ref 72.]

2. Effect on L1210 leukemia

The effect of sc treatment of the leukemic mice with CLE was studied extensively by Li and associates (72), and the treatment was found capable of prolonging the mean survival time (MST) of the treated mice over that of the untreated controls. Results from a typical experiment with the initial treatment given on Day 1 (1 day after leukemic inoculation) are shown in table 2. In this experiment BDF_1 mice were used, and untreated leukemic mice exhibited an MST of 10 days. Treatment with a wide range of doses showed that 250 mg/kg/day for 10 days provided the highest MST (14 days), an increase of 40% over the controls.

A number of additional lots of CLE were prepared by Li and his associates and assayed similarly with the initial treatment being given on Day 1, 3, or 5. The treated mice showed an increase of 30%–70% in MST over the untreated controls (table 3). Treatment started on Day 5 seemed to give better results. In other studies [7] the extent of activity has been variable, a number of extracts showing little or no effect.

3. Intratumor therapy in rodent cancer

A therapeutic effect was observed by Li and his associates (76) when the crude water extract of the whole clam was injected directly into and around solid sc adenovirus 12- and SV40 virus-induced tumors in hamsters. The clam extract was injected daily or at selected

[7] DR&D, DCT, NCI. Unpublished data.

intervals. Following the first injection a local reaction occurred. The tumor often became swollen but soft, then shrank to a dry black eschar, leaving a clean shallow ulcer. The ulcer eventually healed (fig 3). However, only slow-growing small tumors in the range of 0.5–1.0 × 0.5–1.0 cm responded to the treatment, with 50% of 74 treated tumors showing complete regression (table 4). A limited number of melanoma-bearing CDF_1 mice were similarly treated and one third showed complete regression.

4. Prophylactic effect on viral oncogenesis in vivo

Li et al found that when Syrian hamsters were inoculated sc at birth with adenovirus 12 and 4–5 days later were treated with various clam extracts the subsequent tumor formation was greatly reduced (73,75). Results of a typical experiment are illustrated in figure 4. Three groups of baby hamsters, two litters in each group, were inoculated with the same dose of adenovirus 12. Group 1 of 23 hamsters was

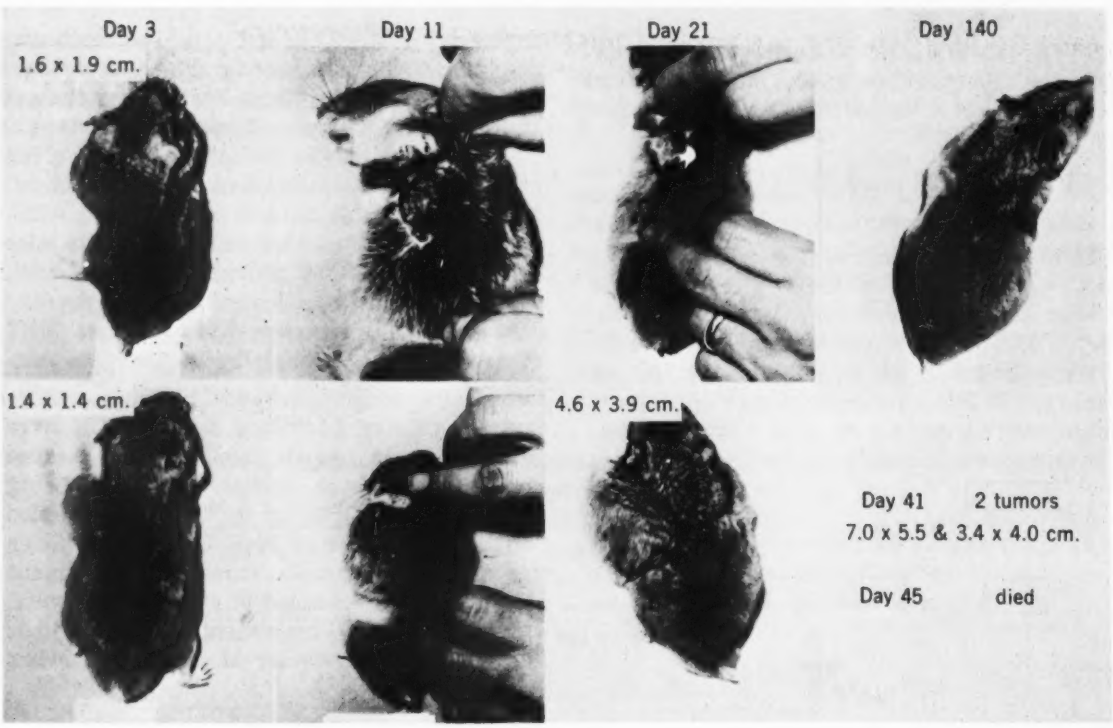

FIGURE 3.—Transplanted SV40 virus-induced tumors in 2 hamsters, 1 treated (above) and 1 untreated (below). Treatment started on Day 0. The 2 hamsters were photographed simultaneously on the indicated days after the 1st treatment. On Day 3, the treated tumor was somewhat swollen; it then showed a local reaction with ulceration and necrosis as described in the text. By Day 21, most of the ulcer was healed, the hair grew back, and the animal was apparently normal. There was no recurrence of tumor in the following 2 years. The untreated tumor grew progressively larger and finally killed the host on Day 45. [Reprinted with permission from ref 76.]

TABLE 2.—Effect of CLE on L1210 in BDF_1 mice when treatment was started on Day 1* (reprinted with permission from ref 72)

Group	Dose (mg/kg) Daily	Dose (mg/kg) Total	No. of mice	MST † (days)	Increase of MST over controls (%)
1	300	3000	8	9.5	–5
2	250	2500	8	14.0	40
3	200	2000	8	13.0	30
4	160	1500	8	11.5	15
5	100	1000	8	12.0	20
6	50	500	8	10.5	5
7 (control)	0	0	20	10.0	0

*This table shows one typical test chosen from 30 positive antitumor tests for more than 10 preparations of CLE, using 30–60 mice for each test (5–8 mice for each test dose). The results were all comparable, with an increase of 30%–70% mean survival time (MST) of treated mice over controls. The optimal dose varied from 70 to 250 mg/kg/day for 3–10 days. In some experiments treatment was delayed to 5 days after tumor implantation and MST of treated mice was similarly increased. MST in all experiments was calculated according to the formula stated here.

†Calculated according to the formula of DR&D.

TABLE 3.—Therapeutic effect of CLE on L1210 in DBA_2 mice: treatment was started on Days 1, 3, or 5

Treatment started on Day—	Lot * No.	Group †	No. of mice	Dose (mg/kg) Daily	Dose (mg/kg) Total	MST (days)	Increase of MST over controls (%)
1	1–4	T	35	100–250	800-2500	10–13.4	30–39
		C	65			7.7–10.0	
3	5–8	T	20	100–200	400–800	10.0–11.8	33–44
		C	16			8.2	
5	9–11	T	30	70–125	270–315	11.0–13.6	41–70
		C	60			7.9–8.5	

* A total of 11 lots of CLE were prepared at different times (Li CP, et al, unpublished data).

† T = treated; C = control.

treated with three sc injections of CLE (lot No. 11) given on the fifth, ninth, and 16th day after virus inoculation at dosages of 0.3, 0.6, and 1.0 mg of extract respectively. The tumor incidence in this group was 30% after 90 days. Group 2 of 20 hamsters was similarly treated, but with another lot of CLE (lot No. 12), and it had a tumor incidence of 50%. The control group of 23 hamsters treated with saline solution had a tumor incidence of 87%. The most extensive inhibition of tumor development was observed relatively early (*see* fig 4). On the 48th day after virus inoculation when 78% of the control hamsters had developed tumors, occurrence of neoplasm in the two treated groups was only 17% and 15%. The total dose of CLE per hamster used in the present experiment was 1.9 mg.

In some experiments adenovirus-inoculated male and female hamsters were separated after weaning and the results were similar, indicating that both male and female hamsters responded to the treatment (75).

In 11 experiments carried out at different times during several years using 660 hamsters, or approximately 60 hamsters in each experiment with half of them for control, Li et al

TABLE 4.—Local treatment of subcutaneous tumors in hamsters with clam extracts * (from Li CP, et al, unpublished data)

Tumor	No. of animals	No. of animals with complete tumor regression/ total No. in group: Treated	Control: No treatment	Control: Treated with placebo
Primary adenovirus 12	17	6/12 (50%)	0/5	ND†
Transplanted adenovirus 12	76	20/38 (53%)	0/23	0/15
Transplanted SV40	56	11/24 (46%)	0/16	0/16
Total	149	37/74 (50%)	0/44	0/31

*Primary or transplanted subcutaneous solid adenovirus 12 and SV40 tumors were used for these experiments. The powdered clam extract suspended in water or saline was injected directly into and around the tumor. After a series of 3–10 injections given daily or at selected intervals, about 50% of the tumors regressed through a process of ulceration (*see* fig 8) and the hosts survived. All control animals, untreated or treated with saline or other placebos, died.

†ND = not done.

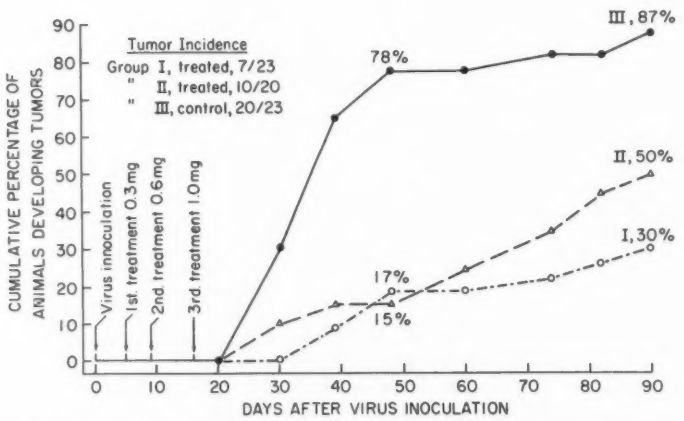

FIGURE 4.—Effect of CLE on adenovirus 12 oncogenesis in hamsters. All hamsters received the same dose of virus. [Reprinted with permission from ref 73.]

(75) showed that treatment with clam extracts reduced the tumor incidence by 50% or more as compared to the controls (table 5).

5. *Prophylactic effect on chemical carcinogenesis*

The clam extract inhibited not only viral oncogenesis but also chemical carcinogenesis as shown by Lavelle (61). This author used the two-stage carcinogenesis, initiation and promotion, in mouse skin as the testing system, and found that the clam extract reduced the growth of tumors in the initiated and promoted mouse skin. More data are needed in this area of investigation.

6. *Effect in vitro*

The tissue culture method has been used for assay of the clam extracts (117,119). In gen-

TABLE 5.—Overall results of the tumor-inhibiting activity of clam extracts (reprinted from ref 75)

Hamsters treated with—	No. of experiments	Dose		Tumor incidence*	
		Initial (mg/kg)	Total (mg/hamster)	Treated	Control
Ammonium sulfate or water extracts of whole clam	7	0.7–1.4	60/100	51/210 (24.3%)	94/200 (47%)
Water extracts of clam liver	4	0.007–0.014	0.12–1.9	33/110 (30%)	87/143 (60.8%)
Total	11			84/320 (26.2%)	181/343 (52.8%)

*No. of animals with tumor/No. of animals in experiment.

eral, malignant cells such as HeLa and KB cells were sensitive to the cytotoxic effect of the clam extracts while cells such as those of human amnion would appear to be less sensitive. However, Li and his associates have studied a large number of cell lines and found that nonmalignant primary rabbit kidney cells were even more sensitive to the destructive effect of the clam extract,[8] indicating that the cytotoxicity of the clam extracts is not confined to cancer cells.

The Rous sarcoma virus (RSV) focus formation system in chick embryo cell culture has been employed by previous workers for testing antiviral substances. Li et al (74) used the same system for evaluating CLE. The assay was patterned after those of Rubin (110) and Temin and Rubin (142). The RSV was introduced onto secondary chick embryo cell cultures. After absorption for 1 hour, the cells were washed, the CLE was added, and the culture was overlayed with agar. The number of foci that appeared after 7 or more days of incubation was compared with the control cultures not treated with CLE. It was found that CLE showed an inhibitory effect on RSV focus formation.

C. Toxicity

The crude aqueous extract of the whole clam prepared by Li and Prescott was studied for acute toxicity in 50 mice by Freinman and Tusing.[9] The powdered extract resuspended in water was administered intravenously (iv) to adult male Swiss albino mice at doses varying from 100 to 2500 mg/kg. The iv LD50 was found to be approximately 680 mg/kg. No signs of toxicity were noted at doses of 100 or 250 mg/kg. Dose-related signs of toxicity observed at the higher levels (464, 1000, and 2500 mg/kg) included ptosis, labored respiration, ataxia, depression, lacrimation, sprawling of limbs, and sometimes convulsion prior to death at the highest level only. Gross autopsy findings of the dead animals revealed congestion of the lungs, kidneys, and/or adrenals; gastrointestinal irritation; and dilation of the mesenteric blood vessels.

The same extract was also given orally to mice at doses varying from 100 to 10,000 mg/kg. The oral LD50 was found to be greater than 10,000 mg/kg as measured 7 days after administration. Ptosis and/or lacrimation were noted 24 hours following oral administration of 10^4 mg/kg. The gross autopsies revealed consolidated areas in the lungs of two animals given 215 or 464 mg/kg orally. No other gross pathologic abnormalities were observed in the group treated orally.

D. Effect on Body Growth

Clam extracts retarded the body growth of hamsters as demonstrated by Li and his associates (73). In one of their experiments there

[8] Li CP, et al. Unpublished data.

[9] Freinman H, and Tusing TW (Hazleton Laboratories, Inc., Falls Church, Va). Personal communication.

were four groups of hamsters: A and B were adenovirus-inoculated and A^1 and B^1 were normal; A and A^1 were treated with CLE while B and B^1 were not (table 6). The initial weight at the age of 7 days of all the animals was approximately the same. On Days 35 and 90 the average weight of the treated hamsters was approximately 20% below that of the untreated controls. At the age of 90 days those treated hamsters which did not develop tumors were also lower in weight than the corresponding controls.

E. Evidence of Concentration of Activity in Clam Liver

In some of the experiments of Liu et al, as described above, one batch of clams was processed into two portions: the liver alone and the remaining parts of clam. Extracts were made from each of these portions by identical procedures (79) and assayed simultaneously for antineoplastic activity against L1210 leukemia. As shown in table 7, the MST of 20 untreated control mice was 8.5 days. Treatment with the extract of the clam minus the liver (diverticulum) exerted no apparent effect. However, when the mice were treated with the CLE, the MST was increased by 39% and 25% over the controls at the doses of 250 and 125 mg/kg. Extracts made in the same way as CLE (fig 2) but from the whole clam, containing liver, showed definite but only moderate activity, and the results were not as consistent as those obtained with extracts made from liver tissue alone. These data indicated that the liver contained most, if not all, of the antineoplastic activity.

F. Biochemical and Biophysical Characteristics

The lyophilized crude clam extract of Schmeer was a brownish powder; it was soluble in water and its activity was nondialyzable. Schmeer and her associates (12) studied the physical and chemical properties of mercenene samples which were desalted in a Research Specialties Co. electric desalter. The results indicated that the mercenene preparations are heterogeneous, salt-containing, low molecular weight (280–550) organic components, and material of intermediate molecular weight (1000–2000). The procedures they used failed to detect any high molecular weight (75,000) components. The authors also stated that purified preparations of mercenene are slowly dialyzable, heat stable, and highly active in tissue culture against human HeLa cancer cells, but they did not present any data concerning antitumor activity of these dialyzable and heat-stable preparations in animals. Schmeer (122) also suggested that mercenene may be either (*a*) a mixture of two or more substances, one readily dialyzable and the other not so; or (*b*) a homogeneous species of such molecular weight that it passes slowly through a cellophane membrane. Still a third possibility is (*c*) that the active principle is a species of low molecular weight, bound rather loosely to a macromolecule which is a protein or a glycoprotein.

The paolins possessing antibacterial or antiviral activities isolated by Li, Prescott, and their associates from mollusks or other marine animals were found to be glycoproteins with a molecular weight of around 10,000 (104). The crude extract obtained from the whole

TABLE 6.—Effect of CLE on the body growth of hamsters* (from Li CP, et al, unpublished data)

Hamsters	Group	Condition	Day 7		Day 35		Day 90		Tumor incidence†
			No. of animals	Wt (g)	No. of animals	Wt (g)	No. of animals	Wt (g)	
Adenovirus-inoculated	A	Treated	30	8.0	29	60	14	102	12/29 (41%)
	B	Untreated	20	7.6	16	77	4	133	14/16 (87%)
Normal	A^1	Treated	11	7.7	11	65	11	120	
	B^1	Untreated	10	7.9	10	79	9	149	

* Each treated hamster received 50, 100, and 200 μg of CLE sc on Days 5, 8, and 12 respectively after virus inoculation. The normal hamsters received the same dose.

† No. of animals with tumor/No. of animals inoculated.

TABLE 7.—Effect of extract of diverticula and whole clam without diverticula on L1210 in BDF_1 mice (reprinted with permission from ref 80)

Group	Preparation	Dose (mg/kg) Daily	Dose (mg/kg) Total	No. of mice	MST (days)	Increase of MST over controls (%)
1	Extract of diverticula	250	1750	5	11.8	39
2	Extract of diverticula	125	875	5	10.6	25
3	Extract of diverticula	62	434	5	9.6	13
4	Extract of remaining body	250	1750	5	8.4	–2
5	Extract of remaining body	125	875	5	8.8	4
6	Extract of remaining body	62	434	5	8.6	1
7	None	0	0	20	8.5	0

body of the common clam is presumably the same as, or similar to, the mercenene of Schmeer. The antitumor activity of the clam extracts varied in nature and in degree. It required only a small quantity or only a mildly active preparation to inhibit S180 in mice but it was necessary to employ a large quantity or a very potent extract to inhibit mouse L1210 leukemia. In experiments of Prescott et al [10] a preparation of CLE (paolin 3) with a molecular weight of 8000 showed antileukemic activity against L1210, but when it was heated to 45°C for 30 minutes its molecular weight dropped to 5000 and its antileukemic activity was lost. Li and Prescott (unpublished data) suggested that the paolins are mixtures of glycoproteins with varying molecular weights (8000–20,000 or more). The large molecular weight paolins could be broken down into a series of lower molecular weight components by various physical or chemical means, some of which evidenced only cytotoxic activity against certain tissue culture cells such as HeLa cells in vitro while others possessed cytotoxic, antibacterial, antiviral, and/or antitumor activity. The antileukemic components occurred in the components with high molecular weights.

The CLE (105) (paolin 3) prepared by Li and his associates is a light brown to white amorphous powder forming a colloidal suspension in water. It is nondialyzable and gives positive reactions with all of the well-known protein tests. The material has an isoelectric point of pH 4.1 and is most active in its antileukemic effect at a pH range of 7.5–8.0. The active fraction contains 11%–13% N, 0.4%–0.9% P, and 1%–1.6% S, and was found to consist of carbohydrate (7%–9%), polypeptide, and an unidentified material. The molecular weight is estimated to be 8000–15,000. Chromatographic studies revealed the presence of the hexoses, glucose, galactose, and mannose, and the pentoses, ribose and arabinose. Hydrolysis of the fraction (paolin 3) yielded 17 amino acids. Purines and pyrimidines were not detectable.[10] The active principle seems to be a glycoprotein or is associated with glycoproteins (70,105).

1. Temperature dependence

One of the most interesting findings in the study of clam extracts is that the presence of the antitumor principle in the clam is dependent upon the temperature, as discovered by Hegyeli (46). He prepared water extracts of

[10] Prescott B, et al. Unpublished data.

the clam from July to December and measured the activity by the number of retine (inhibitor) units/kg and found that the activity dropped in the winter to very low values (table 8). He also placed clams in a basin with a flow of sea water at a temperature varying from 5 to 21 C. The high summer values were restored by keeping the clams in warm water at 15 C for 4 weeks before preparing the extract (table 9).

TABLE 8.—Activity of clam extracts obtained at various times during 1963 (reprinted with permission from ref 46)

Date extract was obtained	Activity (retine units/kg)
5 July	1600–1800
8 July	1600–1800
15 July	1600–1800
24 July	2000–2400
1 Aug	2500–2800
7 Aug	2800–3000
15 Aug	2800–3000
20 Aug	2800–3000
24 Aug	2800–3000
5 Nov	600–700
12 Dec	350–400
10 Feb	346

TABLE 9.—Activity of extracts of clams kept in a bath with a flow of water maintained at different temperatures* (reprinted with permission from ref 46)

Temperature of bath (C)	Time in bath (days)	Activity (retine units/kg)
15.5	7	300–500
21.0	7	400–500
15.5	14	1355
15.5	14	1122
21.0	14	1400
15.5	26	2981
15.5	47	2900–3000

*Before being placed in the bath the clams had been kept in an outdoor pool, approximate temperature 5°C, for 90 days. The activity of extracts obtained from clams after removal from the pool was 346 units.

2. *Thermostability*

Prescott and Li (unpublished data) have studied the effect of heat on the antileukemic activity of the CLE. The CLE was suspended in neutral saline solution and heated in a water bath for 30 minutes at varying temperatures. The heated materials were then assayed for antileukemic activity in DBA_2 mice inoculated with L1210 leukemic cells and compared with the unheated extract. As shown in table 10, when heated at a temperature higher than 40°C, the activity was diminished or lost. However, these data apply only to the antileukemic activity. The prophylactic effect in reducing adenovirus 12 tumor formation in hamsters appeared to be much more heat resistant. Not infrequently the CLE which became inactive after being autoclaved at 121° C for 15 minutes regained some of its prophylactic effect after dialysis against H_2O for 72 hours. This finding suggested that either only a smaller quantity of the active principle is needed to inhibit viral oncogenesis or that the heat breaks some of the large active molecule into small ones and that some of the small dialyzable molecules interfere with the inhibitory effect.

TABLE 10.—Effect of heat on the antileukemic activity of CLE (from Prescott B, et al, unpublished data)

Material heated 30 min	MST (days)	Increase (%)	Body weight change* (g)
Unheated	10.3	29	−0.4
Heated, 40°C	10.6	30	−0.8
Heated, 50°C	9.2	15	−0.4
Heated, 60°C	9.6	20	−0.1
Heated, 70°C	8.8	9	−0.2
Heated, 80°C	8.2	0	+0.6
Heated, 90° C	8.2	0	+0.6
Heated, 100° C	8.2	0	+0.2
Control (mice not treated)	8.1		+1.0

* — = Weight loss; + = weight gain.

G. Mode of Action

Very little is known about the mechanism of action of the shellfish extracts in regard to their antineoplastic capability. The biochemical and physical properties of these extracts which are naturally connected with their activity have been described in section II.F. The major discussion of their mode of action is in section VII. Additional theoretical considerations of different authors are summarized below.

1. *Implication of growth stimulants and inhibitors*

Since the tumor problem involves consideration of the dynamics of abnormal and autonomous cell growth and division, it would ap-

pear that any growth regulators might have applicability. A number of authors have described growth stimulants and inhibitors from various sources including those from the sea (20,93).

Szent-Györgyi et al (134–136) reported the presence of a growth promotor (promine) and a growth inhibitor (retine) in a number of human and animal tissues and body fluids. The two factors are claimed to be present and to be mutually compensatory in their action. They affect not only normal tissue but also cancer cells. When retine is in excess, cancer cells even when present will be destroyed or retarded in their multiplication. When the mercenene (clam extract) was first reported it was regarded as a pure form of retine (46, 115). The present evidence indicates that it is more likely a cytotoxic agent.

Bullough, Laurence, and others (18,21–23, 113) have reported that mammalian epidermis produces and contains a substance called chalone, which in the presence of adrenalin and a glucocorticoid hormone specifically inhibits epidermal mitosis. The chalone is also found in various tissues in a number of animals including codfish. The epidermal chalone derived from a codfish species is reported to inhibit epidermal mitosis in mice and to also be effective in vitro (18). It has been reported that mitosis of the cancer cells is inhibited by this chalone mechanism (22). Chalone extracts were then tested by Mohr et al (88) for antitumor activity in animals. Mice and hamsters bearing melanomata were injected sc with a chalone preparation at a site opposite to that of the tumor; the tumor became soft, necrotic, and ulcerated. It then regressed and the wound healed.

Growth inhibitors have also been isolated from other marine animals. Crude starfish meal has been reported to contain factors which inhibit ecdysis of fly maggots (4) and the growth of the chick when added to the diet (62,145).

However, one may argue that the rationale for using growth inhibitors as chemotherapeutic agents pertains to only one aspect of the problem. Tumors are not necessarily characterized by a rapid rate of cell proliferation. Also, the capacities for infiltration, destructive growth, and formation of metastasis are most important properties of cancer cells, and growth inhibition per se may be insufficient to control these processes.

2. *Possible effect of thiaminase*

Agren (2) found that in certain shellfish and fish tissue there is a heat-labile enzyme (thiaminase) which destroys thiamine. When foxes were fed a diet containing this enzyme they developed paralysis. Kupstas and Hennessy (59) showed the isolation and synthesis of the enzyme "ichthiamine," a product of the action of minced clam tissue on thiamine, and studied the mechanism of inactivation of thiamine by the clam enzyme. Judge (53,54) noted the similarities in the preparation of clam extracts for the enzymatic effect and the preparation of the extracts for antineoplastic activity. The author conducted experiments with four groups of mice: group *A* was fed a thiamine-deficient diet and group *B* was fed a normal diet; both groups *A* and *B* were inoculated with Friend virus. Group *C* was also on a thiamine-deficient diet but was not inoculated with virus, and group *D* was treated similarly to group *A* but was subsequently refed with thiamine (table 11). No evidence of malignancy was found in group *A* on a thiamine-deficient diet, but leukemia developed in group *D* upon re-feeding with thiamine. The author suggested that the virus was still present in group *A* mice, but the capability of responding to malignant transformation was impaired by thiamine deficiency, so when thiamine was added to the diet malignancy developed.

Guthrie et al (41) reported that pyrimidine analogs of thiamine inhibited the growth of certain microorganisms resistant to methotrexate.[11] Jansen (51) observed that patients with Hodgkin's disease, leukemia, and alimentary carcinoma have two to three times the normal amounts of thiamine in their sera. These findings appeared to support Judge's hypothesis that certain tumor cells may require more thiamine than normal cells.

In any event, especially since clam extracts may contain a number of components, the destruction of thiamine may be only one of the pertinent responses to clam extracts.

TABLE 11.—Mean body and spleen weights * (reprinted with permission from ref 54)

Group	No. of female mice	Treatment	Expt No.	MIBW (g)	MTBW (g)	MSW (mg)
A	100	Thiamine-deficient diet + virus	1	17.0 ± 1.2	10.34 ± 1.8	23.7 ± 2.5
			2	16.8 ± 1.3	10.46 ± 1.4	27.8 ± 3.0
B	50	Normal diet + virus	1	16.5 ± 1.3	18.29 ± 2.5	950 ± 150
			2	16.08 ± 2.0	18.37 ± 2.2	720 ± 110
C	50	Thiamine-deficient diet, no virus	1	10.80 ± 1.5	10.01 ± 1.2	26.0 ± 5.0
			2	16.04 ± 1.5	10.71 ± 1.4	27.6 ± 4.5
D	50	(Aliquot of group A) re-fed thiamine	1†	10.34 ± 1.1	17.84 ± 1.4	1100 ± 132
			2‡	10.41 ± 1.2	17.51 ± 2.0	824 ± 80

*MIBW = mean initial body weight; MTBW = mean total body weight; MSW = mean splenic weight.

†43 survivors.

‡40 survivors.

III. ANTINEOPLASTIC SUBSTANCES FROM ECHINODERMS

A. Sea Cucumbers

Many species of this phylum produce highly toxic substances (3,43,129). Yamanouchi (146) isolated a toxic material from the body wall of the sea cucumber (*Holothuria vagabunda*). Nigrelli (90) independently isolated a similar toxic substance from the sea cucumber, *Actinopyga agassizi*, and named it holothurin. Subsequently, sea cucumbers have been found to contain a variety of different but related steroid saponins with a wide range of biologic activities. Nigrelli demonstrated the antitumor effect of the crude holothurin against S180 in mice and this was confirmed by other authors (64,91,94,132,133).

1. Method of preparation

Nigrelli (90) found that the "pink gland" (the organ of Cuvier) of the sea cucumber contained the active toxic agent. Twenty g (wet weight) of this gland was suspended in 50 ml of sea water. When the suspension was autoclaved it was still active and this constituted the stock solution of the crude holothurin; ½ ml killed a mouse in 2½ hours and 0.25 ml in 3 or 4 hours; the mouse was able to survive a dose of 0.05 ml.

2. In vivo assay and results

The antitumor effect was demonstrated by Nigrelli (90,92) in female Swiss-Webster mice which were trocared in the right axillary region with S180. The mice were given sc injections of the autoclaved material at the site of the tumor growth 3 days after implantation. The tumors appeared necrotic and reduced in size on the sixth day after treatment.

Sullivan et al (132,133) inoculated Swiss mice ip with 2×10^5 Krebs 2 ascites tumor cells and treated them with seven ip injections of the crude holothurin, beginning 1 day after inoculation of the tumor cells. When 0.01 mg of holothurin was used for each injection, there was no therapeutic effect, but when 0.05 mg was used there was an increase in the survival time. When a series of seven to ten ip injections of 0.1 mg of the crude holothurin was given every other day, it resulted in a marked increase in MST. As shown in table 12, the MST was increased to 25.4 days as compared with 11.1 days for the controls. In addition, four of the above treated mice survived for 17 months and showed no evidence of tumor. Leiter et al reported that a holothurin fraction from *A. agassizi* inhibited the growth of mammary Adenocarcinoma 755 in mice (64).

3. Cytotoxic effects in vitro

Nigrelli and Zahl (91) and Sullivan et al (132,133) demonstrated that treatment in vitro of S180 or Krebs 2 ascites tumor cells with holothurin markedly reduced or completely inhibited the growth of these tumor cells on subsequent inoculation into normal Swiss mice.

[11] Methotrexate: NSC-740; CAS reg. No. 59-05-2; glutamic acid, *N*-[*p*-[[(2,4-diamino-6-pteridinyl)-methyl]methylamino]benzoyl]-.

TABLE 12.—Effects of holothurin on Swiss mice carrying an inoculum of 2×10^6 Krebs 2 ascites tumor cells (reprinted with permission from ref 132)

No. of mice	Sex	Holothurin injected (mg)	No. of holothurin injections	MST (days/range)	Mean wt on 1st day of tumor cell inoculation/range (g)	Mean wt on 10th day after inoculation/range (g)
6	F	Controls	Controls	11.1/7–15	23.3/21–24.5	29 (7 days)/23–33
24	F	0.1	10 injections in 20 days	25.4*/12–45	23.3/20–25	23.5/20.5–27.5

*The MST is for 20 mice since 4 of the treated mice lived for more than 6 months with no gross indication of a tumor.

Nigrelli et al (97) also reported that holothurin-like substances, extracted from a wide variety of echinoderms from the West Indies, North and South Pacific, and other areas, are able to suppress or completely inhibit human epidermal carcinoma (KB) cell lines in tissue culture.

4. Biochemical and biophysical characteristics

The substance isolated from the body wall, viscera, and organ of Cuvier of the sea cucumbers is water soluble and heat stable and consists of a mixture of steroid glycosides. In Nigrelli's original work (90), the sun-dried Cuvierian glands were first extracted in 95% ethanol and then the toxin in the residual fraction was dissolved in 50% ethanol. On acid hydrolysis, three water-soluble sugars, rhamnose, xylose, and glucose, and three aglycones were obtained. In subsequent studies separate components were isolated, including holothurin A, containing only those substances that form a cholesterol adduct. A tentative structural formula for a saponin present in the holothurin A fraction has been suggested (fig 5). Holothurin and holothurin fractions are toxic to many animal species, including protozoa, fish, and mammals. These materials have a wide range of activities, including hemolytic activity, cytotoxicity, and antifungal effect. The antitumor factor is present in one or more of the components and the materials used for testing the antitumor effect were not yet chemically purified. In his original work (90) Nigrelli stated that the active principle is water soluble, nonvolatile, and heat stable. In addition, it cannot be extracted with acetone, ether, chloroform, or a higher alcohol, nor is it inactivated by these solvents, 10% formalin, 5N HCl, or 5N NaOH. It decolorizes Lugol's solution but not methylene blue. Nigrelli and Jakowska (94) also found that purification of the saponin fraction resulted in a preparation which had tenfold less toxicity but no antitumor effect in vivo.

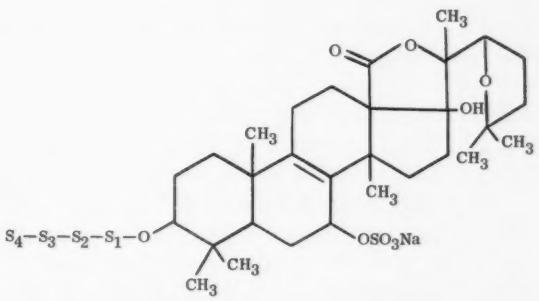

FIGURE 5.—Provisional formula for a saponin present in the holothurin A fraction. [Reprinted with permission from ref 26.]

IV. ANTINEOPLASTIC AGENTS FROM PORIFERA

A. Sponges

Sponges are multicellular animals of very simple organization, belonging to a unique and somewhat isolated group, the Porifera. The sponges live in close association with many forms of life. There are approximately 4000 species and almost all are marine.

Sponges are known to produce substances that are noxious to man and harmful to fish. The toxic and antibiotic properties have been reviewed by Jakowska and Nigrelli (50) and others (43,63,97,112).

B. Spongonucleosides

The important initial observation of the na-

tural occurrence of arabinosylnucleosides was made by Bergmann et al (10–12). It was found that the Caribbean sponge *Cryptotethya crypta* contained several previously unknown and unusual nucleosides which are concerned in nucleic acid metabolism. After Bergmann's discovery a number of investigators became interested in synthesizing the β-D-arabinosyl derivatives. In the literature the term "spongonucleoside" is applied to all of these derivatives whether naturally occurring or not. The biomedical importance of these compounds is considered by Cohen and others (28,63,96,97,131). A related synthetic derivative, cytosine arabinoside (Spongocytidine), possesses antitumor activity as initially demonstrated by Evans et al (33). Cytosine arabinoside is an established antitumor drug today. This is an interesting example in which the study of sponges stimulated synthetic programs that led to the production of a useful antitumor drug.

C. Halitoxin

Baslow and Turlapaty (6) reported antitumor activity for an extract named halitoxin prepared from the sponge *Haliclona viridis*. The sponge was collected in the waters surrounding the Florida Keys and was dried at 100° C for 15 hours. The dried sponge was homogenized in water and the insoluble residue discarded after centrifugation at 2000 × *g*. Similar cytotoxic extracts have been obtained from a number of *Haliclona* species but could not be made from species of several other sponge genera.

The BALB/c mice implanted ip with Ehrlich ascites tumors were treated with halitoxin, 50 μg/g given ip on Days 4–7 after tumor implantation. The treated mice weighed about 10% less than the untreated controls during the treatment period. The halitoxin completely inhibited tumor growth in about 30% of the animals but did not prolong the survival time of mice exhibiting tumor growth. Sc treatment showed no effect (table 13). The authors suggested that the antitumor effect is due to the cytotoxic properties of the extract.

In a series of preliminary tests on mice bearing heterografted Walker M and Walker 256 tumors, Burkholder (24) found that the ip injection of saline suspensions of the Caribbean sponges *Mycale microsigmatosa, Speciospongia vesparia, Ianthella ardis, Cinachyra cavernosa,* and *Virongia fistularis* inhibited tumor growth.

V. OTHER ANTINEOPLASTIC SUBSTANCES OF MARINE ORIGIN

Sigel et al (128) made an extensive survey of potential antitumor activity in extracts from a large variety of tropical marine invertebrates. (A few species of marine plants were also investigated.) Altogether, 132 species from 13 phyla, 59 families, and 104 genera were collected from the waters surrounding the Florida Keys and the island of Bimini. The specimens were collected at various times of the year and from several depths. They were ground and extracted with approximately 50% aqueous ethyl alcohol. The extracts were lyophilized and the dry material was dissolved in saline for testing.

The in vivo testing was performed in the PS system in BDF_1 mice (P388 lymphocytic leukemia). The mice were implanted ip with the leukemic cells and were then treated ip with 0.4 ml of the suspension or solution of the test material. The treatment was given daily from Days 1 to 6. The results were expressed as a T/C% value, ie, the median survival time of the test group in days divided by the control median survival time × 100.

Extracts from 20 species caused significant prolongation of life in the leukemic mice. Those species represented six phyla of animals: Mollusca, Coelenterata, Porifera, Chordata, Arthropoda, Echinodermata, and one division of algae, Rhodophyta. The extract obtained on two separate occasions from *Ecteinascidia turbinata* not only prolonged the life of animals, but 50% of the leukemic mice were still alive after a period of 30 days when the experiment was terminated. Some of the results are shown in table 14.

Pettit et al (101) made extracts of a large number of marine invertebrates and vertebrates from a broad geographic area (Atlantic and Pacific coasts of North and South America and the coasts of Asia) and tested the extracts for antineoplastic activity with the Walker 256 carcinoma, L1210 leukemia, and P388 leukemia. Some representative species have given very encouraging results. An aqueous 2-propanol extract of the Bryozoan, *Bugula neritina,* in-

TABLE 13.—The effect of halitoxin on the growth of Ehrlich ascites tumors in BALB/c mice* (reprinted with permission from ref 6)

	Drug given ip						Drug given sc					
	Control†		Tumor		Tumor + halitoxin‡		Control		Tumor		Tumor + halitoxin	
Day	Weight (g)	Deaths (%)	Weight (g)	Deaths (%)	Weight (g)	Deaths (%)	Weight (g)	Deaths (%)	Weight (g)	Deaths (%)	Weight (g)	Deaths (%)
0	29.8		29.4		29.3		29.6		29.7		27.7	
4	29.8	0	30.8	0	29.9	0	28.8	0	30.1	0	28.3	0
5							30.2	0	30.6	0	28.7	0
6							29.8	0	30.6	0	28.5	0
7	29.6	0	32.1	10	26.8	15	30.0	0	31.1	0	28.2	0
8							29.0	0	31.8	0	28.7	0
9	29.6	0	32.1	30	27.8	25	29.2	0	34.0	0	29.6	0
11	29.0	0	32.6	30	30.2	25	29.6	0	37.0	0	33.2	0
12							29.6	0	39.4	20	35.2	10
13	28.0	0	30.4	40	29.8	25	29.7	0	40.0	20	37.5	10
14							29.6	0	40.9	20	39.9	10
15	27.0	0	32.1	40	28.3	25	29.6	0	41.9	40	41.6	40
16							29.8	0	42.5	40	41.0	40
17	30.0	0	33.0	50	26.1	40	30.0	0	43.0	50	40.7	55
18							29.8	0	42.0	50	40.5	55
19	30.2	0	32.2	60	27.7	40	31.2	0	41.9	60	40.3	60
21	30.6	0	35.1	70	29.0	40						
22							31.2	0	46.6	100	48.5	100
25	33.0	0	37.6	70	31.6	40						
29	29.8	0	38.5	80	31.8	50						
31	31.4	0	35.8	80	34.8	60						
34	32.6	0	44.0	80	34.8	60						
37	33.6	0	39.0	90	33.0	70						
40	32.6	0	40.0	100	35.0	70						
60	34.8	0			33.0	70						

*Control groups contained 10 mice; all experimental groups contained 20 mice.

†Control mice were injected with 0.2 ml water. Weight and deaths are mean values based on surviving and dead animals on the experimental day indicated.

‡The drug-treated surviving animals were killed on the 60th day and were found to be free of any tumor pathology.

TABLE 14.—Active extracts in the P388 system: positive in two separate samples (reprinted with permission from ref 128)

Genus and species	Phylum	Dose (mg/kg)	T/C (%)*
Strombus gigas	Mollusca	400	136
		400	133
Gorgonia ventalina	Coelenterata	200	140
		200	136
Chondrilla nucula	Porifera	90	140
		90	130
		60	127
		60	123
Ecteinascidia turbinata	Chordata	265	140 (6/12 cures)
		265	272
Limulus polyphemus	Arthropoda		

$$*T/C\% = \frac{\text{median survival time of test animals}}{\text{median survival time of control animals}}$$

jected ip into BDF_1 mice bearing P388 lymphocytic leukemia led to 68%–100% life extension. An ethanol extract of *Molgula occidentalis* gave a 77% extension of life in animals bearing the same leukemia. Active components were also isolated from other specimens.

Epmolieva et al (32) isolated triprotamines in the form of sulfates from the milt of individual sturgeon stocks and found that protamine from *Acipenser guldenstadti* and *Ac. stellatus* inhibited tumor growth by 60%–80% (Sarcoma 37 in mice), while protamine from *Ac. nudiventris* was essentially inactive.

Tabrah et al (138) conducted some interesting studies based on ancient Polynesian medicine. Infusion of cooked kaunaoa (tropical sea worms) tentacles has been used for treatment of cancer by the Hawaiian natives. Accordingly, these authors secured these worms (*Lanice conchilega*) at the island of Hawaii, ground them in 30% ethanol, and filtered the mixture through filter paper and evaporated at 50°C to 0.4 ml/g of original wet solids. Mice inoculated ip with Ehrlich ascites tumor cells were treated by ip injections of the crude extract at various dosages twice daily for 2 weeks. The average time of death for the untreated control mice was 16 days after injection of the tumor cells, but 60%–100% of the treated mice remained alive at 25 days. The extract was also inhibitory against the splenomegalic effect of Rauscher virus. An extract made from a similar polychaetous worm *Reteterebella queenslandia* collected at Heron Island on the Great Barrier Reef of Australia gave a similar antitumor effect.

VI. MARINE FACTORS CONCERNED IN IMMUNOTHERAPY AND HOST RESISTANCE AGAINST CANCER

Factors concerned with host resistance, in relation to infection and growth of tumor, have also been obtained from the sea.

A. Reticuloendothelial System (RES) Stimulants

In 1962, Ransom et al (107) obtained an RES stimulant "restim" from a preparation of yeast wall. The stimulation of RES was measured by the increased rate of phagocytosis and clearance of carbon particles in vivo. Although it had no significant effect on the course of experimental infection of *Salmonella typhimurium* in mice, when specific antibody derived from either active or passive immunization of the mice was present, restim significantly enhanced their resistance as judged by survival time of the host. Later, Heller et al (47,48) isolated the same factor in a nontoxic lipid from shark liver. The restim was prepared briefly as follows: 1 kg of fresh shark liver was homogenized in a blender with absolute ethanol. The homogenate was then diluted with ether and hexane, allowed to stand for 2–3 hours, and then filtered. The freshest liver gave the most active lipid. Because one extraction did not remove all of the lipid, the extraction procedure was repeated by

taking up the wet residue in ethanol, ether, and hexane. It was then filtered once more, the residue was discarded, and the solvents were removed in vacuo. The concentrate was then taken up in hexane and the hexane layer filtered through anhydrous sodium sulfate. The hexane was then removed under vacuum, and the remaining lipid was dissolved in anhydrous ether. The ether solution was then treated with cold acetone, and the mixture was kept in the freezer at –28°C for 24 hours. After centrifuging at −2°C, the yellow acetone-rich supernatant was discarded. The residue was transferred into a flask with anhydrous ether. The ether was removed by distillation, and the lipid was stored at –28°C under nitrogen. The yield was about 20% by weight of the wet shark liver.

Bliznakov studied the effect of restim on RSV-induced tumors in young chicks (14,15) as follows. The restim was injected into three groups of chicks at different time intervals after the inoculation of RSV, without administration of antiserum: in group 1, 7 days after infection of RSV; in group 2, 14 days after RSV; and in group 3, on the seventh and 14th days after RSV. The results, shown in figure 6, indicate that no regression occurred in the untreated group. However, about 10% complete regressions occurred in birds receiving only one dose of restim (7 or 14 days after the RSV), while 43.8% of the chicks receiving both doses of restim (7 and 14 days after the RSV) demonstrated complete regression of local tumors ($P < 0.01$).

Later, Bliznakov et al (16) claimed that coenzymes Q had stimulating effects on the RES. After an iv injection of coenzymes Q_6 or Q_{10} the phagocytic activity in rats was enhanced and pretreatment with coenzyme Q_{10} resulted in a twofold increase of the primary hemolytic antibody production against sheep erythrocytes in mice. However, it is doubtful whether the authors have enough data to confirm these observations.

B. The Sea Star Factor

New interest in the immunotherapy of cancer (13,85,89,98,148) has recently been developed from the study of cell-mediated immunity and delayed hypersensitivity. Bacillus Calmette-Guérin (BCG) is known to be a potent immunologic adjuvant and the accumulation of macrophages during the delayed hypersensitivity reaction is considered to be involved in the destruction of tumor cells. An interesting finding was reported by Prendergast et al (102,103) who isolated a protein from the coelomocytes (macrophages) of the sea star

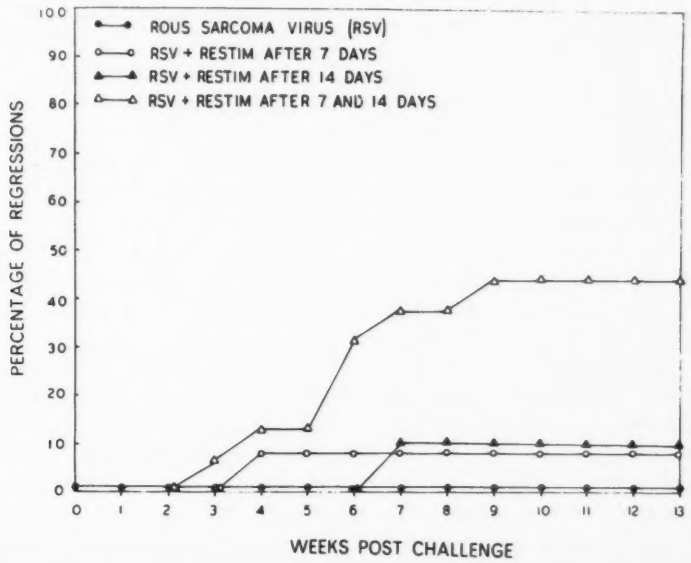

FIGURE 6.—Effect of postchallenge treatment on regressions of Rous sarcoma in chicks. [Reprinted with permission from ref 15.]

(Asteria forbesi) having both a delayed skin hypersensitivity property and a macrophage inhibitory factor as evidenced in a large number of mammalian species tested. In in vitro experiments this factor showed significant inhibition of macrophage migration without requiring the help of sensitized lymphocytes. The active principles were concentrated in the euglobulin fraction and precipitated by dialysis against large volumes of 0.0005 M phosphate buffer (pH 5.5). Chromatography on Sephadex G75 of the euglobulin preparation resulted in the elution of two major peaks and the skin reactivity was confined to peak II. The factor has a molecular weight around 32,000. Heating at 56°C for 30 minutes destroyed the ability to inhibit macrophage migration.

C. The Effect of Cod Liver Oil

Olson et al (99) illustrated in 1962 the dietary influence on the incidence of lymphoid tumor of the chicken when they observed that one lot of cod liver oil contained a factor which increased the incidence of lymphocytoma whereas another lot did not. Tekeli (141) found that the effect of cod liver oil on the incidence of lymphoid tumor of the chicken depended on the presence or absence of stearin; nondestearinated oils increased the incidence of lymphocytoma while destearinated oils decreased it. Kakuk and Olson (55) found that the effect of stearin varied with the dosage used. In their experiments, the white leghorn chickens were injected ip with RPL 12 leukosis virus and then divided into three groups; one group received a basal diet alone and a second and third group received a basal diet containing 3% and 9% of the stearin fraction respectively. After 200 days the maximum incidence of lymphocytoma was reached in the basal- and 3% stearin-added groups. The maximum incidence was not reached until 300 days in the 9% stearin-added group and the peak was also lower than that in the other two groups (fig 7). Thus, stearin, when incorporated in the diet, appeared to diminish the induction of lymphocytoma in the chicken. However, the diet with 9% stearin also caused atrophy of the gonads and delayed spermatogenesis and development of sex characteristics. It is not clear whether the effect on lymphocytoma development is specific or attributable to some general nonspecific mechanism of growth inhibition.

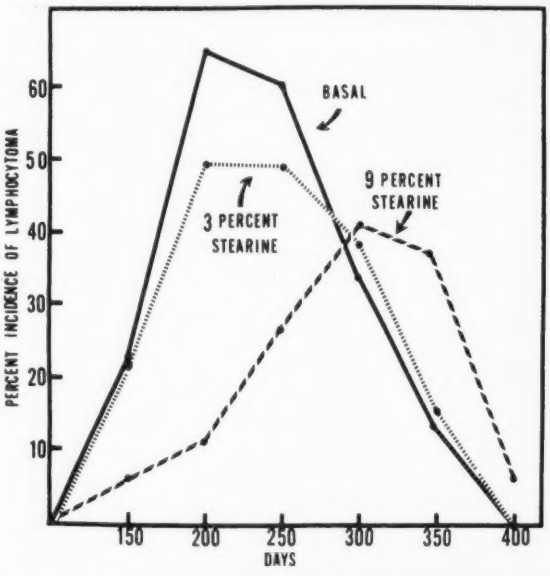

FIGURE 7.—Percent incidence of lymphocytoma based on number of birds at risk at different periods of the experiment. Chickens receiving the basal and 3%-stearin diets had a higher incidence of lymphocytoma than chickens receiving the 9%-stearin diet. [Reprinted with permission from ref 55.]

VII. THE IMPLICATIONS OF ANTIVIRAL, ANTIBACTERIAL, CYTOTOXIC AGENTS AND MAGNESIUM SALTS

A. Antiviral Agents

The implication of certain antiviral agents in cancer therapy is obvious since oncogenic viruses have been shown to induce cancer in animals. In recent years there has been an increasing number of antiviral substances found in the sea. Generally speaking, there are three groups of materials from the sea containing antiviral activity, namely (*a*) raw sea water and certain marine bacteria (40,82–84, 86); (*b*) algae (1,9,38,42,56,77,130,139,140); and (*c*) mollusks (69,70,79–81,100). Raw sea water has shown a direct virucidal effect against a number of viruses such as polioviruses, $ECHO_{32}$, influenza A, etc. The active principle is heat labile and appears to be a protein. The virucidal activity of raw sea water probably has its origin in certain ma-

rine bacteria. An extract of bacterium identified as *Vibrio marinus* demonstrated the same or similar antiviral activity as the raw sea water (84).

Extracts of brown algae (seaweed, kelp) (38,56) showed antiviral activity against mumps virus and influenza B (but not A) virus when tested in embryonated chick eggs. The extracts also inhibited mouse pneumonia virus in mice. The agar which is commonly used in preparations of solid bacteriologic medium is derived from red algae. It inhibited the growth of certain mutants of EMC virus and some other viruses in vitro. The activity is due to sulfated polysaccharides (139).

In general, the algae contain two types of antiviral factors: polypeptides or proteins and polysaccharides.

Extracts of certain mollusks, such as abalone, oyster, clams, etc, have shown both antibacterial and antiviral activities. The two responses were successfully separated in oyster preparations (68,104).

Common CLE showed both antineoplastic and antiviral activity (against influenza A virus) and the two types of activity have not been separable (*see* footnote 8).

B. Antibacterial Agents

There are a number of reviews on antibacterial agents found in sea materials (5,24, 36,97). Although they have not been implicated in cancer therapy, the dual activity of CLE against both bacteria (*see* footnote 8) and neoplasm suggests the importance of further study of these substances. Clinically, during the treatment of human leukemia and other forms of neoplasia, the complication of bacterial infection is a serious problem. Any antitumor agent also possessing antibacterial activity may provide some additional therapeutic advantage.

C. Cytotoxic Agents

A number of cytotoxic substances have been found in the sea. Some of them have shown antitumor activity as described above while others have not been tested for antitumor properties. Starfish have been reported to contain toxic substances in their tissues (19). Toxic saponins have been isolated from certain species of these animals such as *Pycnopodia helianthoides* (sunburst sea star), *Patria miniata* (red-web sea star), *Pisaster brevispinus* (short spine sea star), and *Pisaster ochraceus* (purple sea star). Extracts made from a wide variety of these animals exerted a cytotoxic effect on human KB cell lines in tissue culture (97).

Both marine microalgae and macroalgae add large amounts of organic compounds of extracellular and intracellular origin to the environment and are important producers of biomedical substances. A semipure dry substance isolated from the extracellular phase is termed prymnesin which has been found to be cytotoxic for Ehrlich ascites tumor cells. Dafni and Shilo (30) have followed the cytotoxic process microscopically and found the initial response to be an increase in cell volume. Release of macromolecular constituents, decline in cell volume, and death and lysis were successive events resulting from exposure to prymnesin.

D. Magnesium Salts

A number of chemical elements have been considered as possibly playing a role in regard to tumor growth, and particular importance has been ascribed to magnesium (Mg). Sea water has a high content of Mg (1290 ppm) and complicated antineoplastic substances from the sea may contain attached nondialyzable Mg salts. There are a number of reports on the relationship between the content of Mg salts in the environment and the incidence of cancer, particularly stomach cancer in man, ie, the higher the content of Mg salts in the soil, the drinking water, the plant food, etc, the lower the morbidity from cancer. The early literature (before 1931) was reviewed thoroughly by Shear (125) and he found that these claims were not adequately substantiated by supporting evidence. More recently, Bazikyan (8) reported 5136 cases of stomach cancer and found that in those areas where stomach cancer morbidity is higher, the soil, wheat grown in it, and drinking water had a reduced content of Mg salts (up to 27.0 mg/equivalent of Mg per 1.0 kg of soil). On the contrary, areas with a lower incidence of stomach cancer had abundant Mg salts in the soil (up to 550 mg/equivalent of Mg per 1.0 kg). The author studied the anticarcinogenic effect of Mg salts in mice. When

mice were injected with $MgCl_2$ in doses of 60 mg/kg daily for 7 days before painting with carcinogen and the daily treatment was continued for an additional 50 days following application of the carcinogen the tumor incidence decreased by 49%. On the other hand, Franz and Tittelbach-Helmrich (35) reported that an Mg-deficient diet retarded the growth of a solid transplanted tumor but that an excess of Mg administered either in the diet or by injection showed no antitumor effect. Shilovtsev et al (126) stressed the importance of a time factor, pointing out that the longer the period of prophylactic treatment with Mg salts the lower the incidence of tumor. Tromp and Diehl (143) called attention to the observation that several cattle diseases in the Netherlands and in other countries are associated with soil which is deficient in certain trace elements and that man may be similarly affected with regard to certain diseases including cancer. For iodine and fluorine in man it is a generally accepted fact. Thus, Jasmin (52) and Bois (17) reported that spontaneous thymus tumors developed in rats kept on a chronic Mg-deficient diet. As Mg serves as an activator of a variety of enzymes (eg, ribonuclease is an Mg-dependent enzyme) (127), the possibility exists that its deficiency may disturb the enzyme balance in the body cells.

VIII. REMARKS

The present article reveals that a number of authors have reported activity against experimental tumors in certain marine materials from various localities, with differing methods and at different times. An "antitumor agent" in the broad sense should possess one or more of the following abilities: (*a*) to counteract the effect of chemical, physical, or biologic carcinogens; (*b*) to suppress the process of carcinogenesis at some stage once it has been initiated; (*c*) to interfere with the multiplication and development of transformed cancer cells into malignant tumors; (*d*) to destroy cancer cells; and (*e*) to stimulate the physiologic or immunologic mechanism of the host to combat cancer cells. The reported antitumor agents from the sea contained some or all of these activities although in most cases the activity was mild.

The following activities have been reported from the common clam: (*a*) inhibitory effects on the growth of cancer cells in tissue culture, (*b*) inhibition of S180 in mice, (*c*) inhibition of L1210 and P388 mouse leukemia,[12] (*d*) induction of tumor regression in rodents after intratumor injection, and (*e*) prophylactic effect against tumor formation in animals induced by virus or carcinogen.

So far, two main types of clam extracts have been prepared: the crude water extract of the shucked whole clam (mercenene) and the partially purified CLE (paolin 3). A few remarks concerning the technique of preparation may be mentioned here in order to discuss the difference between the two types of extracts. Generally speaking, when a fresh homogenate of the shucked whole clam was made (*see* sections II.A.1.b.i and II.A.2.a) the antitumor activity was mostly left in the supernate after moderate centrifugation. The supernate can be lyophilized without losing activity but too extensive centrifugation tended to destroy it. (When such a supernate was passed through a Sharpless centrifuge at 20,000 × *g* the sediment was entirely inactive.) The supernate per se was often used as the crude extract by Schmeer. In Li's laboratory the supernate was lyophilized and the resulting powder was regarded as the crude extract.

The crude and partially purified (by Sephadex G25 column) extracts made by Schmeer inhibited the growth of cancer cells in tissue culture and that of S180 in mice but neither of them showed activity against L1210 mouse leukemia in Li's laboratory. On further purification the crude extracts yielded components of small molecular weight (700 or below), but they showed no in vivo activity even when the sensitive S180 was used for testing. However, when the crude water extract of the whole clam was directly injected into rodent tumors it caused tumor regression (76).

When a fresh homogenate of the clam liver (not the whole clam) was made (fig 2) and the supernate after centrifugation was lyophilized for testing, the crude material possessed some mild inhibitory activity against L1210 leukemia in mice. When this supernate was

[12] *See* footnote 8.

precipitated, first by cold EtOH, then by 8% NaCl, the final lyophilized product which was regarded as the partially purified CLE (fig 2) evidenced definite inhibiting activity against L1210 and P388 mouse leukemia in addition to its inhibitory effect against cancer cells in tissue culture and S180 in mice.

Dr. M. L. King [13] has made serious attempts to increase the antileukemic activity of the CLE against L1210 by chemical means, unfortunately without success. Dr. B. Prescott of the National Institutes of Health has compared (unpublished data) the amino acid composition of the CLE and paolin 2 from oyster (104) which possessed no antitumor activity. He found substantially higher amounts of phenylalanine and methionine in CLE compared with paolin 2. Whether these differences are related to the antitumor activity is not known.

The demonstration of the prophylactic value of the clam material against viral tumor in hamsters by Li and his associates (73,75) is of some interest. CLE in a total dose of 100 μg per hamster given in two or three sc injections within 5 days after birth was effective in protecting some of the hamsters from developing tumors during the later part of their life. Both the crude water extract of the shucked whole clam and the partially purified CLE were effective for prophylaxis, but the total necessary effective dose of CLE per hamster was much smaller than that of any crude extracts of the whole clam (0.1–1.9 mg for CLE and 55–85 mg for the crude extracts). It is unlikely that the effect was due to antiviral activity because the treatment with the clam material was started 4 or 5 days after adenovirus inoculation and by that time the inoculated virus would have been adsorbed. The clam extract was given at an area distant from virus inoculation. Multiplication of adenovirus has not been proved to be necessary for development of tumors and active virus is rarely demonstrated in the induced tumors in hamsters. The following possibilities may be considered: either the clam material acted as a growth inhibitor which inhibited body growth as well as cancer growth or it in some way acted as an immunizing agent, like BCG, which may stimulate the host immunity against cancer.

According to Lavelle (61), the crude whole clam extracts could also prevent chemical carcinogenesis in mice although the experiments were very preliminary.

The possible implication of the antitumor agents from the sea on immunotherapy of cancer may also be considered. Although the sea star factor isolated by Prendergast et al (102, 103) has not yet been tested against neoplasms, the skin hypersensitivity reaction caused by it is very much like that produced by BCG or tuberculin which inhibits neoplasms (89,98, 148). The author suggested the possible relationship between the protein obtained from the sea star coelomocytes and that produced by sensitized mammalian lymphocytes. Li et al (76) observed that when an aqueous clam extract was injected directly into small solid sc adenovirus 12- and SV40 virus-induced tumors in hamsters, 50% of the treated hamsters showed complete tumor regression. The mechanism causing tumor regression is not clear. Li et al suggested the following possibilities: (*a*) the local reaction may be caused by some toxic or proteolytic activities in the clam extracts and is therefore different from that produced by BCG or other immunologic factors; (*b*) the same biologic reaction may be caused by different biochemical substances, or the clam extracts and BCG may contain some similar components; (*c*) the tumor regression may have resulted from the reaction of the clam extract in combination with the host mechanisms.

To date, most of the antitumor substances of marine origin are relatively impure, demonstrating a number of biologic activities, some of which may be of therapeutic value while others are harmful to the host. For instance, Dr. M. Sigel (personal communication) demonstrated that treatment with crude extracts from *Ecteinascidia turbinata* resulted in significant prolongation of life extension in the P388 lymphocytic leukemia system but also inhibited antibody production in the mice to sheep red blood cells. With further purification of the

[13] From the National Defense Medical Center, Taiwan, unpublished data.

crude extracts of marine materials, active component(s) which may selectively destroy cancer tissue may be obtained.

Since the problem of enhancing the host immunity against cancer cells becomes increasingly important, sea materials such as the shark's liver, claimed to be capable of stimulating RES (47,48), should be further investigated. Also, it has been commonly claimed to be important in eliminating or reducing any carcinogenic substances in human food, but it is rarely considered that anticarcinogenic substances may also be present in our diet. The presence or absence of these factors or the counterbalance of the opponents may be involved in the geographical incidence of certain tumors.

An additional priority might be to determine the specific source of the activity of materials from marine organisms. For instance, the antitumor activity of the common clam appears to be mostly concentrated in its liver. However, occasionally certain other parts of the clam body demonstrated as much activity as the liver (*see* footnote 8). When the clams were placed in a tank with running clean sea water for some time the antitumor activity of the clam was reduced (Liu OC, personal communication). These observations suggest that the antitumor component might be taken up from the environment by the clam and then concentrated or modified in the liver. Certain marine bacteria possessed antiviral activity (40) and it is conceivable that other marine bacteria may produce antitumor factors. BCG produces a delayed hypersensitivity reaction in many mammals. As previously mentioned, the CLE, which is slightly pyrogenic (73) when injected directly into rodent tumors, produced a local reaction inducing tumor regression, in a manner somewhat similar to that produced by BCG (76). It is suggested that it would be worthwhile to culture the various marine organisms from the mollusks to determine whether there are some organisms present which possess antitumor activity. The marine animals showing antitumor activity such as mollusks, may be kept in specially constructed tanks with fresh running sea water, such as that devised by Liu et al (fig 8) (78). With such tanks the influence of food, temperature, additives, or other extrinsic factors such as bacteria can be studied.

Finally, a word may be said about the methods of testing antitumor activity in marine substances. In addition to the various in vivo methods, the conventional tissue culture method with the use of HeLa or KB cells in roller tubes is often used. As already mentioned, this technique indicates only the cytotoxicity of the testing material and is not necessarily related to antitumor activity in vivo.

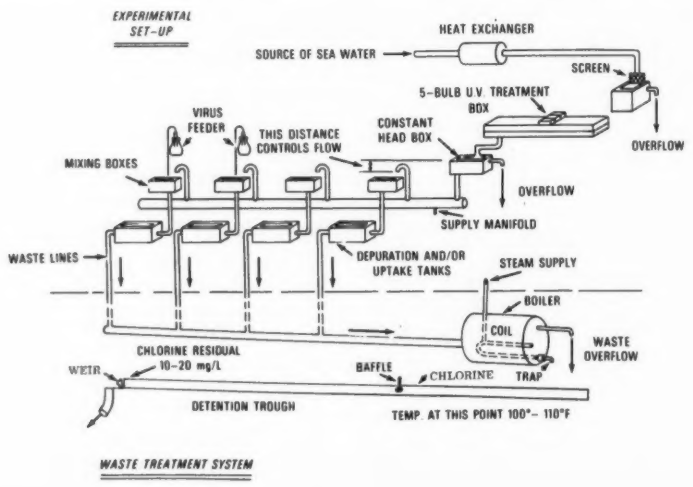

FIGURE 8.—Diagram of experimental depuration system and seawater supply. [Reprinted with permission from ref 78.]

The sea remains a largely untapped resource in the search for new antitumor agents. The broad range of marine animals and plants from which biologically active products and some antitumor substances have been obtained suggests that a continuing and expanded effort be made in the screening, evaluation, development, identification, and determination of the mechanism of action of antitumor agents from the sea.

IX. APPENDIX I.—General Distribution of the Antineoplastic Substances in the Sea: A Summary

Source	Author(s)	Year	Main Findings	References
1. Chrysophyta: *Prymnesium parum* Carter (algae)	Dafni Z, et al	1966	Cell extract or culture suspension named prymnism induced lysis of Ehrlich ascites tumor cells in vitro	30
2.1 Porifera (sponges): *mycale microsigmatosa, Speciospongia vesparia, Ianthella ardis, Cinachyra cavernosa, Verongia fistularis*	Burkholder PR	1968	Saline suspensions of these sponge species injected ip inhibited growth of Walker M and Walker 256 tumors in mice	24,25
2.2 *Haliclona viridis*	Baslow MH, et al	1969	Extract (halitoxin) injected ip into BALB/c mice inoculated with Ehrlich ascites tumor cells reduced the mortality by 30%	6
2.3 *Chondrilla nucula*	Sigel MM, et al	1970	Extract administered ip into BDF_1 mice bearing lymphocytic leukemia led to 23%–40% life extension	128
3. Coelenterata: *Gorgonia ventalina*	Sigel MM, et al	1970	Extract administered ip into BDF_1 mice bearing lymphocytic leukemia led to 36%–40% life extension	128
4. Bryozoa (moss animals): *Bugula neritina*	Pettit GR, et al	1970	An aqueous 2-propanol extract injected ip into BDF_1 mice inoculated with P388 lymphocytic leukemia led to 68%–100% life extension	101
5.1 Echinodermata: *Actinopyga agassizi* (sea cucumber)	Nigrelli RF, et al; Sullivan TD, et al; Leiter J, et al	1952–1962	Extract of the organ of Cuvier of sea cucumber (holothurin) was injected sc at the site of inoculation of S180 in Swiss mice. Tumor growth was inhibited. When Swiss mice were inoculated with Krebs 2 ascites tumor cells ip and then treated with ip injections of holothurin, the mean survival time was increased.	90,91,132, 133,64

IX. APPENDIX I.—General Distribution of the Antineoplastic Substances in the Sea: A Summary—Continued

	Source	Author(s)	Year	Main Findings	References
5.2	*Asterias forbesi* (sea star)	Prendergast RA, et al	1970	A protein isolated from the coelomocytes (macrophages) of the sea star showed both delayed hypersensitivity and the property of inhibiting macrophage migration in a large number of mammalian species. It is included here because it may have implication in immunotherapy of cancer.	102,103
6.1	Mollusca: *Mercenaria mercenaria* (clam)	Schmeer MR, and her associates	1963–1964	Ammonium sulfate and aqueous extract of the whole body of shucked clam (mercenene) inhibited the growth of HeLa and KB cells in culture and S180 and Krebs 2 ascites tumors in mice. The extract was partially purified by Sephadex G25 and when it was injected sc into Swiss mice bearing Krebs 2 ascites tumors it reduced the tumor weight and increased the survival time of the treated mice as compared with that of the untreated controls.	114,115
6.2	Mollusca: *Mercenaria mercenaria* (clam)	Hegyeli A	1964	The antitumor effect of the clam was found to be temperature dependent. Clams obtained in the summer months showed more activity than those obtained in the winter months.	46
6.3	Mollusca: *Mercenaria mercenaria* (clam)	Li CP, et al	1965–1968	Li and his associates prepared crude aqueous extracts of the shucked whole clam and partially purified extracts of the clam's liver. The following activities were demonstrated: 1. Therapeutic effect against L1210 leukemia in mice, giving 40% (or more) life extension 2. Prophylactic effect against adenovirus 12-induced tumors in hamsters, reducing tumor incidence by 50% 3. By direct intratumor injections into small tumors in hamsters induced by	70-75

IX. APPENDIX I.—General Distribution of the Antineoplastic Substances in the Sea: A Summary—Continued

Source	Author(s)	Year	Main Findings	References
			adenovirus 12 or SV40 virus, the clam extract caused complete tumor regression in about 50% of the cases. It also showed similar but less prominent effect against melanoma in mice. 4. Inhibition of RSV in vivo and in vitro 5. Inhibition of influenza A virus in chick embryos 6. Inhibition of the growth of certain pathogenic bacteria	
6.4 Mollusca: *Mercenaria mercenaria* (clam)	Judge JR	1966	Ammonium sulfate extracts of clam partially purified by Sephadex G25 inhibited murine leukemias induced by Moloney and Friend viruses	53,54
6.5 Mollusca: *Mercenaria mercenaria* (clam)	Lavelle SM	1970	Clam extract inhibited 2-stage chemical carcinogenesis in mouse skin	61
6.6 Mollusca: *Mercenaria mercenaria* (clam)	Fishtein MB	1969	Crude aqueous extract inhibited S180 in mice	34
6.7 *Ostrea virginica* (oyster), *Busycon canaliculatum* (whelk), *Helix* (snail), *Strombus gigas* (conch), *Mya areneria* (soft-shell clam), *Spisula solidissima* (surf clam)	Schmeer MR, et al; Sigel MM, et al; Li CP, et al; Fishtein MB	1965–1970	Extracts of these animals showed some antitumor effect in vivo	116,128, 72,34
7. Annelida *Lanice conchilega Reteterebella queenslandia* (tropical sea annelids)	Tabrah FL, et al	1970	Crude extracts of tentacles of these two annelids inhibited the growth of Ehrlich ascites tumor in 60%–100% of treated mice	138
8. Arthropoda: *Limulus polyphemus*	Sigel MM, et al	1970	Extract administered ip into BDF_1 mice bearing lymphocytic leukemia led to 35%–45% life extension	128
9. Chordata: *Ecteinascidia turbinata*	Sigel MM, et al	1970	Extract administered ip into BDF_1 mice bearing lymphocytic leukemia led to 40%–172% life extension and afforded 50% survivals for 30 days	128

IX. APPENDIX I.—General Distribution of the Antineoplastic Substances in the Sea: A Summary—Continued

	Source	Author(s)	Year	Main Findings	References
10.1	Chordata/tunicata: *Molgula occidentalis* (sand sea squirts)	Pettit GR, et al	1970	Ethanol extract gave 77% life extension, using P388 lymphocytic leukemia as the test system	101
10.2	*Clavelina picta* (clear sea squirts)	Pettit GR, et al	1970	Extract gave 100% life extension, using P388 lymphocytic leukemia as the test system	101
11.1	Chordata/vertebrata: *Gadus morhua* (Codfish)	Bullough WS, et al	1968	Epidermal chalone derived from a codfish species inhibited mitoses in vitro and in vivo. Chalone preparations also showed antitumor activity which is not species specific.	21
	Chordata/vertebrata: *Gadus morhua* (Codfish)	Kakuk TJ, et al	1967	Cod liver oil containing stearin when fed to chickens inoculated with RPL-12 leukosis virus, delayed the onset of lymphocytoma	55
11.2	*Negaprion brevirostris* (Sharks) and other species	Heller JH, et al; Bliznakov EG	1963–1968	A reticuloendothelial system stimulant (restim) was isolated from a nontoxic lipid of the shark's liver. When restim was given together with antiserum to chickens inoculated with RSV, it reduced the tumor incidence by 50% as compared with the chickens treated with antiserum alone.	47,48,14
11.3	*Acipenser guldenstadti* and *stellatus* (Sturgeon fish)	Epmolieva ZV, et al	1970	Protamine isolated from these animals inhibited solid Sarcoma 37 tumors in mice by 60%–80%	32

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